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**VICKERS-ARMSTRONGS
LIMITED**



**HANDBOOK
OF THE
VICKERS-BERTHIER
LIGHT MACHINE GUN
(FOR LAND SERVICE)**

HANDBOOK
OF THE
VICKERS-BERTHIER
LIGHT MACHINE GUN
(FOR LAND SERVICE)



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Vickers-Berthier Light Machine Gun.

(For Land Service.)

View of the right side of the Gun.

HANDBOOK

OF THE

VICKERS-BERTHIER

LIGHT MACHINE GUN

(FOR LAND SERVICE)

TABLE OF CONTENTS

	PAGE
Table of Contents	iii-v
List of Plates	vi
General Data	vii
Particulars of Ammunition for Vickers R.C. Guns	viii
 GENERAL CHARACTERISTICS	 1, 2
Description of the Gun	3
 THE NON-RECOILING PARTS	 3-24
Receiver	3-5
Removable Parts fitted in the Receiver	5
Tangent Sight	6
Breech-Block Catch	6
Magazine-Catch Device	6
Magazine-Catch	7
" " Lever	7
" " Axis Pin, Flap Spring and Bush	7
" " Spring and Plug	7
" " Slide	7
" " Flap	8
Locking Shoulder	8
Ejector and Ejector Cover	8
Ejection-Slot Cover (complete)	8
Cocking Handle (complete with Rod)	9
Cocking Rod	9
Cocking-Rod Handle	9
" " Catch	9
" " Claw	9-10
" " Catch Spring and Handle Spring	10

TABLE OF CONTENTS—continued

THE NON-RECOILING PARTS—(continued)	PAGE
Magazine-Opening Cover (complete)	10
Back Block, Securing Pin and Trigger-Guard Plate	10-11
Trigger Gear	11-12
Buffer	13
Barrel-Locking Key (complete)	13
Barrel	14
Barrel-Stop Piece	14
Barrel Handle	14-16
Gas-Regulating Device	16-17
Fore Sight	17
Muzzle Tube	17
Gas Cylinder	17-18
Main-Spring Tube	18
Adjusting Screw	18
Adjusting Nut and Spring Guide	18
Butt (complete)	19
Butt	19
Adjustable Butt-Rest Ferrule	19
Pistol Grips	19
Butt Plate	19
Cocking-Rod Cover	20
Bracket for Adjustable Butt Rest	20
Adjustable Butt-Rest Catch	20
" " " Catch Spring	20
Front Legs	20
" " Bracket	21
" " Hinge	21
" " Catch	21
" " Distance Piece	21
" " Spring	21
" " Outer Tube	21
" " Inner	22
" " Feet	22
" " Collar, Keep and Screw	22
Adjustable Butt Rest	22
" " " Nut	23
" " " Outer Screw	23
" " " Inner	23
" " " Stop	23
" " " Centre Guide	23
" " " Foot	23
Magazine	24

TABLE OF CONTENTS—continued

	PAGE
THE RECOILING PARTS	25-28
Breech Block	25-26
Extractor, Plunger and Spring	26-27
Firing Pin, Spring and Retaining Spring	27
Feed Piece, Spring and Axis Pin	27
Piston	28
Main Spring	28
THE ACTION OF THE MECHANISM	29-35
To Prepare for Firing	29
Cocking Action	29-30
To Fire	30
Forward Movement	30-31
Recoil Movement	31-32
General Remarks on the Action of the Mechanism	33
Action of the Fire Control Key in the Trigger Gear	34
To set for "single-shot fire"	34
To set for "automatic fire"	34
To set for "safe"	35
GENERAL INSTRUCTIONS	36-47
To Dismantle the Gun	36-37
To Assemble " "	37-38
To Dismantle the Trigger Gear	39
To Assemble " " " "	39
To Dismantle the Extractor	40
To Assemble " " " "	40
To Dismantle the Ejector	40
To Assemble " " " "	40
To Dismantle the Firing Pin	40
To Assemble " " " "	40
To Dismantle the Cocking Rod	41
Functioning of the Gas Regulator	41
To Load the Magazines... ..	41
To Change " " " "	42
Use of the Front Legs	42
Points to be observed Before and After Firing	42
Care and Maintenance of the Vickers-Berthier Light Machine Gun	43
Cleaning and Lubrication	43
Examination of the Components after Practice	43
Monthly Examination	43
Stoppages	44-46
List of Parts	47-52

LIST OF PLATES

PLATE NO.	DESCRIPTION	PAGE
	FRONTISPIECE—View of the Right Side of the Gun	ii
1.	View of the Left Side of the Gun	53
2.	Plan View of the Gun	54
3.	View of the Gun mounted on Tripod	55
4.	„ „ „ „ for Anti-Aircraft Firing	56
5.	Three Views of the Receiver	57
6.	The Barrel (complete)	58
7.	The Barrel with Details	59
8.	The Back Block with Main Spring Tube and Details of Trigger Gear, etc.	60
9.	The Butt and its Details, with Adjustable Butt Rest ...	61
10.	The Cocking Handle, Tangent Sight, Barrel-Locking Key, Ejection Slot Cover, etc.	62
11.	Details of the Magazine, with Main Spring	63
12.	The Magazine Catch Details, Breech Catch, Magazine-Opening Cover, Locking Shoulder, etc.	64
13.	The Piston, Gas Cylinder, Breech Block and Breech Block Details	65
14.	Details of Front Legs	66
15.	{ Dismantling the Barrel 1st position }	67
	„ „ 2nd „ }	
16.	Diagrams showing Approximate Positions of the Breech Block for the Various Stoppages	68
17.	General Arrangement of the Gun	69
18.	Diagrams showing the Action of the Breech Mechanism ...	70
19.	Diagrams of the Trigger Gear	71

VICKERS-BERTHIER LIGHT MACHINE GUN

(FOR LAND SERVICE)

GENERAL DATA

Calibre	Muzzle Velocity	} As for the Infantry Cartridge.		
Length of Barrel (without Muzzle Tube) ...		22.078 in.	=	560.75 mm.
Length of the Gun (Overall) ...		46.7 in.	=	1,186 mm.
Weight of the Barrel (with all its fittings) ...		6.4 lbs.	=	2.9 kg.
,, the Gun (with Fore Legs) ...		22.0 lbs.	=	10.0 kg.
,, 30-Round Magazine (Empty) ...		0.81 lbs.	=	0.367 kg.
,, ,, ,, (Full) ...		2.3 lbs.	=	1.04 kg.
,, Adjustable Butt Rest ...		1.15 lbs.	=	0.52 kg.
Rate of Fire per Minute (Automatically, with One Magazine) 500 (about)				
Rate of Fire per Minute (Automatically, including time to change the Magazine) 250 (about)				
The Ballistics will depend upon the type of cartridge used.				

PARTICULARS OF VARIOUS NATURES OF AMMUNITION FOR VICKERS RIFLE CALIBRE MACHINE GUNS.

(APPROXIMATE METRIC DIMENSIONS)

	6.5 mm. Mannlicher- Schönauer	6.5 mm. Portuguese Mauser	6.5 mm. Japanese	6.5 mm. Mannlicher	6.5 mm. Mannlicher- Carcano	7 mm. Mauser	7.5 mm. Schmidt- Rubin	7.62 mm. Russian
CARTRIDGE								
Length, mms.	77.7	82.6	75.7	77.5	7.62	78.0	77.5	77.14
Weight, grammes	23.9	23.5	22.7	23.9	21.6	23.7	26.2	23.4
Rim or Rimless	Rimless	Rimless	Semi-R'less	Rim	Rimless	Rimless	Rimless	Rim
BULLET								
Shape of Nose	Round	Round	Round	Round	Round	Pointed	Pointed S.L. Base	Pointed
Envelope	Cupro Nickel	Cupro * Nickel	Cupro Nickel	Cupro Nickel	Cupro Nickel	Cupro Nickel	Cupro Nickel	Cupro Nickel
Material	Coated Steel			Coated Steel		Coated Steel	Coated Steel	
Length, mms.	31.5	31.9	32.5	31.5	30.0	29.7	34.8	29.34
Diam. (max.) mm.	6.7	6.7	6.6	6.7	6.8	7.2	7.8	7.9
Weight, grammes	9.65	10.00	10.5	10.4	10.5	9.00	11.28	9.6
PROPELLANT								
Nature	Nitro- Cellulose	Nitro- Cellulose	Nitro- Cellulose	Nitro- Cellulose	Ballistite	Nitro- Cellulose	Nitro- Cellulose	Nitro- Cellulose
Charge, grammes	2.34	2.47	2.08	2.34	2.25	3.1	3.2	3.12
BALLISTICS								
Muzzle Velocity M/s	732	732	720	732	700	861	800	869
Muzzle Energy M/KGS	283	293	296	283	281	340	368	369
Chamber Pressure Atmos.	2890	2890	3000	2890	2900	2970	2600	2750
VELOCITIES AND PRESSURES AT 60° FAH. (15.5° CEN.).								

	7.65 mm. Mauser	7.65 mm. Mauser	.30" U.S.A.	.303" Mark VII	.303" Mark VI	7.9 mm. Mauser	8 mm. Lebel
CARTRIDGE							
Length, mms. ...	75.7	75.7	84.8	77.5	77.5	80.4	75.4
Weight, grammes ...	24.1	25.0	25.4	25.1	27.0	23.9	27.6
Rim or Rimless...	Rimless	Rimless	Rimless	Rim	Rim	Rimless	Rim
BULLET							
Shape of Nose ...	Pointed	Pointed S.L. Base	Pointed S.L. Base	Pointed	Round	Pointed	Pointed S.L. Base
Envelope	Cupro Nickel	Gilding Metal	Gilding Metal	Cupro Nickel	Cupro Nickel	Cupro-Nickel	No Envelope
Material ...	Coated Steel	Coated Steel	Coated Steel			Coated Steel	Bullet of Copper Zinc
Length, mms. ...	27.3	33.7	33.7	33.0	32.4	28.4	39.2
Diam. (max.) mms.	7.9	7.9	7.8	7.9	7.9	8.2	8.3
Weight, grammes ...	10.0	11.3	11.2	11.3	14.0	10.0	12.8
PROPELLANT							
Nature ...	Nitro- Cellulose	Nitro- Cellulose	Nitro- Cellulose	M.D.T. Cordite	Cordite	Nitro- Cellulose	Nitro- Cellulose
Charge, grammes ...	3.02	2.65	3.25	2.44	2.05	3.15	3.00
BALLISTICS							
Muzzle Velocity, M/s ...	838	796	823	747	628	861	701
Muzzle Energy, M/KGS	358	367	385	320	280	378	326
Chamber Pressure, Atmos.	2600	3000	3040	2820	2670	2740	2130
VELOCITIES AND PRESSURES AT 60° FAH. (15.5° CEN.).							

VICKERS-BERTHIER LIGHT MACHINE GUN

(FOR LAND SERVICE)

GENERAL CHARACTERISTICS

The Vickers-Berthier Light Machine Gun is of the gas-operated type in which part of the highly compressed gas, generated by the explosion of the charge, is used to operate the Breech Mechanism.

The mechanism is reliable and capable of sustained fire for long periods without stoppage.

The Gun is fed from a magazine, normally holding 30 rounds, which fits into an opening in the top of the Receiver.

The characteristic features of the Gun are its extreme simplicity and light recoil. The various Parts can be easily assembled and dismantled and are so constructed that incorrect assembly is impossible. Covers are provided which completely protect the working parts from dirt during transport. The Gun has clean lines and is without objectionable knobs and handles that fly backward and forward during firing.

The Barrel is easily detachable and, when overheated, can be changed in about 5 seconds without being handled and without the necessity of handling other parts of the Gun. The Gun can be completely dismantled for cleaning in 35 seconds, and re-assembled in 75 seconds.

By a simple movement of a Lever near the Trigger, the Gun can be used as an automatic weapon, or for firing single shots. This Lever is also used to set the Gun to "safe." Used automatically, 250 aimed rounds can be fired in one minute. Used as a single-shot Gun, 90 aimed rounds can be fired in one minute.

On cessation of fire, the Breech remains open and the Barrel Chamber empty. There is, consequently, no possible danger of accidental discharge, or of a premature explosion taking place, should the Barrel have reached a high temperature.

The Gun is usually fired with the Gunner in the prone position, in which case the Barrel is supported at a convenient height on two folding legs at the front of the Gun. This arrangement generally gives sufficient accuracy, but for shooting at longer ranges a small Elevating Gear is supplied, which can be inserted under the Butt.

The Gun may be fired either from the shoulder or from the hip by the Gunner when in the standing position. It may also be fired at any angle of elevation or depression without having to re-adjust any part.

When mounted on the Tripod as shown in Plate 3 the Gun becomes in all respects the equal of a heavy Machine Gun.

This Tripod can be adapted for anti-aircraft firing as shown on Plate 4.

CORRIGENDUM. *Page 2, line 3.*

The second sentence of Paragraph 1 should read:—

“This arrangement generally gives sufficient accuracy, but for shooting at longer ranges an adjustable Butt Rest is supplied.”

VICKERS-BERTHIER LIGHT MACHINE GUN

(FOR LAND SERVICE)

GENERAL DESCRIPTION

The component parts of the Gun may be divided into three main groups :—

- (1) The Non-Recoiling Parts.
- (2) The Feed Mechanism, which is contained in the Magazine and may be classified with the Non-Recoiling Parts.
- (3) The Recoiling Parts.

It is operated automatically by two forces :—

- (a) The explosion of the charge, which forces the Recoiling Parts backwards.
- (b) A Spiral Spring, which carries the Recoiling Parts forward.

THE NON-RECOILING PARTS.

The main Non-Recoiling Parts consist of the Receiver with those parts attached thereto, the Barrel with Gas Block, the Gas Cylinder and the Feed Mechanism.

Receiver. (*See Plate 5, Page 57.*)

The Receiver (1) is the main body of the Gun and forms a casing for the recoiling Breech Mechanism. It is bored and screwed an Acme thread, at the front end, to take the Barrel (55) and the threads are interrupted to facilitate assembly. The interruptions are made unequal, so that the Barrel (55) can only be inserted in the correct position. The top part of the front face of the Receiver (1) is cut away, at the same angle as the thread, to take the Barrel-Stop Piece (56). A hole is bored at the bottom front end to take the Gas Cylinder (9) and a slot is cut right through the right-hand side to accommodate the right-hand key

on the Piston (10), while a groove is milled on this side, in which the Cocking Handle slides. Keyways are cut in the front end of the hole for the Gas Cylinder (9) to accommodate the keys on the outside of the Gas Cylinder. A recess is milled on the inside of the left-hand side to accommodate the key on the left-hand side of the Piston (10) and a slot is cut through the right-hand side for the ejection of the empty Cartridge Cases.

It is milled out internally to accommodate the Breech Block, Piston Head, etc. The rear end is machined and the bottom rear end cut away to receive the Back Block (86), a recess being cut out at the top rear end for hooking in the Back Block (86), and two recesses cut in the outsides, at the bottom, to take the lugs on the Back Block (86), while a hole is drilled at the bottom, near the rear end, for the Pin (87) securing the Back Block.

A hole is drilled at the bottom, near the front end, for the Tripod Pin and just in front of this is another hole for the Barrel-Locking Key (80), which latter is grooved to take the key on the Barrel-Locking Key. On the left-hand side, near the Barrel-Locking Pin hole, a projection is formed in which two notches are cut to take the Handle (81) of the Barrel-Locking Key (80), the lower of these notches is for the locked position and the upper is for assembling the Gas Cylinder (9). Just above the hole for the Tripod Pin, a square hole is cut through both sides for the Piston Stop (7), which is permanently fixed in the Receiver, and to the left of this a hole is drilled through both sides for a hardened Steel Cam (6) which lifts the Breech Block (11) on its forward movement and which is also permanently fixed in the Receiver. Just above the square hole for the Piston Stop (7), and a little to the rear, two holes are cut for the hardened steel Bullet-Lead Cam (4) and the Feed-Piece Cam (5), and these also are permanently fixed in the Receiver. Near the front end, at the underside of the Barrel opening, a hole is drilled to take the Fouling Pin (8) which ensures that the Barrel is right home before the screw can be engaged, and this Pin also is permanently fixed in the Receiver.

A rectangular box is formed on top of the Receiver, which has an open top for the insertion of the magazine. At the front end of this box two lugs are formed and drilled for hingeing the Magazine-Opening

Cover (39), while a recess is milled out to receive the Catch (41) and Springs (42) for locking the Cover (39). A lip is formed on the inside front of this box for hooking in the magazine and two grooves are cut in the top, at the sides, to admit the projections on the Magazine Platform. On the rear end of the box, at the top, two lugs are formed and drilled for the Magazine-Catch Lever (26) and Flap (35), while, just below this, a square hole is cut through both sides for the Locking Shoulder (109) and a hole is drilled longitudinally for the Magazine Catch (25), Spring (32) and Plug (33). Two keyways are cut on the rear outsides of this box to take the keys on the inside of the Magazine Slide (34). To the rear of this, two projections are formed on the top and drilled to hinge the Breech-Block Catch (36).

A long grooved strip is formed on the right-hand side to take the Ejection-Slot Cover (121). On the left-hand outside, just below the square hole for the Locking Shoulder and on the centre line of the Gun, a horizontal projection is formed, which is cut right through to admit the Ejector (21) and has vertical grooves cut in it to receive the Ejector Trunnions and a dovetail groove to receive the Ejector Cover (22). At the rear, on the left side, a dovetail seating is provided for a Clinometer or for use with the Anti-Aircraft Sight, while, at the top rear, a dovetail seating is provided for the Tangent-Sight Boss (43), which is permanently secured to the Receiver.

The removable parts fitted in the Receiver (1) are as follows :—

Tangent Sight.

Breech-Block Catch (36), Spring (37) and Pin (38).

Magazine Catch (complete).

Locking Shoulder (109) and Pin (110).

Ejector (21) and Cover (22).

Ejection-Slot Cover (complete).

Cocking Handle (complete with Rod).

Magazine-Opening Cover (complete).

Back Block (86), Pin, and Trigger-Guard Plate.

Trigger Gear.

Barrel-Locking Key (complete).

Tangent Sight. (*See Plate 10, Page 62.*)

The Tangent Sight consists chiefly of an Adaptor (45), a Stem (44), an Aperture Plate (49) and a Nut (53) fixed to it, a Sleeve (48) and an Adjusting Screw (52) with a knurled head having " V " grooves on the underside and a small spring for holding the Aperture Plate at any desired range. The Adaptor (45) has two " V " projections on the side for engaging with horizontal and vertical " V " grooves in the Boss (43) on the Receiver, Adaptor (45) and Stem (44) being held in position by the Pin (46), Nut (47) and Spring (51), the latter allowing side movement for engaging and disengaging the Adaptor from the " V " grooves in the Boss (43). The Stem (44) is mounted on the left side of the Boss (43) and can be placed in the vertical or horizontal positions by a sharp jerk. It is graduated from 200 yards to 2,000 yards. An index line is marked on the Aperture Plate (49).

Breech-Block Catch. (*See Plate 12, Page 64.*)

The Breech-Block Catch (36) is a forked lever having two catches on the underside for engaging the Breech Block (11) and holding the mechanism in the open position when the last cartridge has left the magazine. It is pivoted at the rear end by the Axis Pin (38) and the forked end at the front projects into the Receiver and is acted upon by the projections on the Magazine Platform. A recess is milled near the middle which receives the end of a Spring (37) for holding the Catch (36) in the up position, clear of the Breech Block (11), for normal working.

Magazine-Catch Device. (*See Plate 12, Page 64.*)

The Magazine-Catch Device consists of the following parts :—
Magazine-Catch (25).

- „ - „ Lever (26).
- „ - „ „ Bush (27).
- „ -Flap Spring (28).
- „ -Catch-Lever Axis Pin (29).
- „ „ Securing Pin (30) for Axis Pin (29).
- „ „ Screw (31).
- „ „ Spring (32).
- „ „ „ Plug (33).
- „ „ Slide (34).
- „ „ Flap (35).

Magazine Catch.

The Magazine Catch (25) is a small catch with a projecting gib on the front end for engaging with the magazine. It is bored at the rear end for the Spring (32) and a slot is cut in the top to take the Lever (26). It is drilled and tapped at the top to take the Screw (31) securing it to the Catch Slide (34).

Magazine-Catch Lever.

The Magazine-Catch Lever (26) is bored to take the Bush (27) and has a projection at the bottom for engaging with the Catch (25) as well as a projecting stop above for engaging with the Flap (35).

Magazine-Catch Axis Pin, Flap Spring and Bush.

The Axis Pin (29) secures the Flap (35), Bush (27) and Spring (28) to the Receiver and is secured in position by the Pin (30). It has a small hole drilled in the inside face of the head to fix one end of the Spring (28).

The Flap Spring (28) is a torsion Spring with one end fixed in the Receiver and the other end in the Axis Pin (29) and holds the Flap in the vertical position.

The Bush (27) acts as a bearing and houses the Spring (28).

Magazine-Catch Spring and Plug.

The Magazine-Catch Spring (32) is a spiral compression spring, one end of which is housed in the Catch (25) and the other in the Plug (33).

The Plug (33) is screwed into the Receiver and is bored to hold one end of the Spring (32).

Magazine-Catch Slide.

The Magazine-Catch Slide (34) fits over the end of the magazine box on the Receiver (1) and has internal keys which slide in the keyways on the Receiver. At the front end, it has two slots cut out to clear the lugs on the Receiver (1) and a square hole cut in the top to admit the projection on the Catch (25), while a hole is drilled and counterbored to take the Screw (31) which secures the Catch (25) to the Slide (34). Serrations are cut on the front outsides to form finger grips. A groove is cut in the top rear end to take the lip on the Flap (35), when the latter is not in use. It is undercut at the front end to engage the rear end of the Magazine-Opening Cover (39).

Magazine-Catch Flap.

The Magazine-Catch Flap (35) is a flat plate having a double eye formed at one end and a lip formed at the other for engaging in the groove in the Slide (34). It is bored for the Axis Pin (29) and drilled for the Securing Pin (30). Its function is to operate the Catch (25) and its normal position is vertical, being held there by the torsion Spring (28).

Locking Shoulder. (*See Plate 12, Page 64.*)

The Locking Shoulder (109) is a hardened square steel pin with an oval head and a pin hole for the Securing Pin (110). It is ground away at suitable friction angles on the front side to afford a ready release of the Breech Block (11) after the Gun is fired. Its function is to support the Breech Block in the firing position until the gases drive the Piston (10) and Breech Block (11) to the rear.

Ejector and Ejector Cover. (*See Plate 10, Page 62.*)

The Ejector (21) is a lever having solid trunnions which are partly cut away for assembly and locking. It has a projection on the rear end which engages with a cam groove cut in the left side of the Breech Block (11) and a projection on the front end which does the actual ejection.

The Ejector Cover (22) is a flat steel plate with bevelled sides which fits into the dovetailed groove in the Receiver (1) and has a channel-shaped clip riveted to it.

Ejection-Slot Cover (Complete). (*See Plate 10, Page 62.*)

The Ejection-Slot Cover (121) is a long flat plate recessed and grooved on the inside to slide on the Receiver (1). It has a boss formed on the rear end which is drilled for the Catch (122), Nut (123) and Spring (124). The Catch (122) has a key-shaped head which fits into a groove in the Receiver for locking the Cover in the open position and is screwed at the other end for a Nut (123) which holds the Spring (124). It has a projection on the bottom which is engaged by a similar projection on the Cocking Rod (111), so that, when the Gun is cocked by hand for initial loading and the Cover is closed, the cocking action automatically opens the Ejection Cover (121).

It is not advisable to lock this Cover in its closed position.

Receiver (1) and engages with the end of the key on the right side of the Piston (10). It can only be assembled after the Cocking Handle (complete) has been placed in position.

Cocking-Rod-Catch Spring and Handle Spring.

The Cocking-Rod-Catch Spring (119) is a spiral spring having its ends held in the Handle (113) and the Catch (114), and serves to hold the Catch (114) in engagement with the Catch on the Receiver, thus locking the Cocking-Rod Handle in the front position. To release the Catch (114), the Handle (113) is pulled to the rear and the Claw (115), being in contact with the key on the Piston (10), pulls the latter together with the Breech Block (11) to the rear into the "cocked" position. When the Cocking Handle is returned to the forward position, this arrangement of the Spring enables the Catch on the Receiver to push back the Cocking-Rod Catch (114) without interfering with the Cocking-Rod Handle (113).

The Cocking-Rod-Handle Spring (118) is a torsion spring fixed in the Handle (113), and prevents the latter from rattling about when the Cocking Handle is at the rear and the Catch (114) is out of action.

Magazine-Opening Cover (Complete). (*See Plate 12, Page 64.*)

The Magazine-Opening Cover (39) is hinged to the front end of the rectangular box on the top of the Receiver (1) by the Pin (40), and serves to cover up the opening when the magazine is not in place. Serrations are cut in the outside of the hinge boss, and these are engaged by a Catch (41) and two Springs (42) fitted into the Receiver (1), so that the Cover (39) may be held in the closed, open, or vertical positions, as desired. A thin lip is formed on the rear end for engaging in the front end of the Magazine-Catch Slide.

Back Block, Securing Pin, and Trigger-Guard Plate. (*See Plate 8, Page 60.*)

The Back Block (86) is made from a solid steel block. The main body is milled out at the left side to receive the Trigger Gear, and holes are drilled to take the Trigger (95), Trigger-Sear Axis (98), Fire-Control Key (105), and for the three positions of the Fire-Control Key, while a hole is drilled in the front end for securing to the Receiver. A guard is formed on the underside for the Trigger and a skeleton frame at the rear

to take the Pistol Grips (134, 135). The top projection closes the end of the Receiver and is bored to take the Buffer (90) and Spring (91), and bored and screwed to receive the Main-Spring Tube (137). It is milled out at the rear to take the Butt (125) and drilled for a Pin (125a) securing the Butt to the Back Block. Projecting pieces are formed on each side, at the rear, for engaging in the recesses in the rear of the Receiver, while two grooves are cut in the right side to accommodate the Cocking-Rod Cover (120). A projection is formed on the top right-hand side which acts as a stop for the Ejection-Slot Cover (121).

The Back-Block Securing Pin (87) is held in position by a Spring (89) and Plunger (88), which engages in the head of the Back-Block Securing Pin (87). A groove is cut nearly the whole length of this Pin, which engages with the point of the Plunger (88) and prevents the Pin from being accidentally withdrawn.

The Trigger-Guard Plate (93) is a flat plate fitted into the left side of the Back Block (86) and drilled for the Trigger (95), Trigger-Sear Axis (98) and Fire-Control Key (105). The hole for the Fire-Control Key (105) is recessed to take the key on the end of the Fire-Control Key (105), which locks the Cover-Guard Plate (93) to the Back Block.

Trigger Gear. (*See Plate 8, Page 60.*)

The Trigger Gear consists of the following parts :—

Trigger (95).

Trigger-Sear (96) with Guide Pin (97).

„ „ Axis (98).

„ „ Pawl (99).

„ „ „ Pin (100).

„ „ „ Spring (101).

„ „ Spring (102).

„ Spring (103).

„ „ Boss (104).

Fire-Control Key (105).

„ „ „ Plunger (106).

„ „ „ „ Spring (107).

„ „ „ Knob (108).

The Trigger (95) has solid trunnions for engaging in the Back Block (86) and Cover-Guard Plate (93), a nose for engaging the Fire-

Cocking Handle (Complete with Rod). (*See Plate 10, Page 62.*)

The Cocking Handle (complete with Rod) is made up of the following parts :—

Cocking-Rod (111).

Cocking-Rod Handle (113).

„ Catch (114).

„ Claw (115).

„ „ Pin (116) with Split Pin.

„ Handle and Catch Pin (117).

„ „ Spring (318).

„ Catch Spring (119).

Cocking Rod.

The Cocking Rod (111) is a long flat rod on the sides of which keys are formed for sliding in the grooves on the Receiver (1). It has a head formed on the front end for taking the Claw (115) and the Handle (113), and pin holes are drilled for the Pins (116 and 117) securing these two items. A hole is recessed to take the end of the Spring (119). It is slotted through transversely to take the Claw (115) and the Catch (114), and has a projecting piece on the top for engaging with the Ejection-Slot Cover.

Cocking-Rod Handle.

The Cocking-Rod Handle (113) is a round knob with a double eye formed at one end and drilled to take the Pin (117). A hole is drilled up the centre and it is cut away at the rear to admit the Catch (114), Torsion Spring (118) and Spiral Spring (119), while a small hole is drilled inside to take the end of the Torsion Spring (118).

Cocking-Rod Catch.

The Cocking-Rod Catch (114) is a small bell-crank-shaped catch for locking the Cocking Handle to the Receiver (1) whilst firing. It is drilled for the Pin (117) and a hole is recessed for the end of the Spiral Spring (119). The Pin (117) secures both Handle (113) and Catch (114) to the Rod (111).

Cocking-Rod Claw.

The Cocking-Rod Claw (115) fits into the Cocking Rod (111) and is secured there by the Pin (116) and Split Pin. It projects into the

Control Key (105), a catch for engaging the Trigger-Sear Pawl (99) and the usual finger grip. A hole is drilled for the Boss (104) holding the Trigger Spring (103).

The Trigger Sear (96) is a lever which is pivoted on the Axis (98), having a rectangular hole cut out to take this Axis and allow a slight horizontal movement. It has a lip on the front end which engages in an undercut in the Back Block (86) and a catch on the top front for engaging with the Catch (10d) on the underside of the Piston (10). Underneath, near the front, a hole is recessed to take the end of the Trigger-Sear Spring (102). The rear is slotted out vertically to take the Pawl (99), drilled to take the Pin, and a hole is recessed to take the end of the Trigger-Sear-Pawl Spring (101).

The Trigger-Sear Axis (98) is a rectangular block which fits into the Trigger Sear (96) and has two solid trunnions.

The Trigger-Sear Pawl (99) fits into the Trigger Sear (96) and is drilled for the Pin (100).

The Trigger-Sear-Pawl Spring (101) fits between the Sear (96) and the Pawl (99) and holds the Pawl in normal position.

The Trigger-Sear Spring (102) fits between the Sear (96) and the Back Block (86) and holds the Sear in normal position.

The Trigger Spring (103) fits between the Trigger (95) and the Back Block (86) and holds the Trigger in normal position.

The Trigger-Spring Boss (104) is riveted to the Trigger (95) and holds the end of the Trigger Spring (103).

The Fire-Control Key (105) is a lever having a pin formed on it which fits into the Back Block (86) and Trigger-Guard Plate (93). On the end of this pin is a key which fits into a groove in the Cover-Guard Plate and locks both the latter and the Fire-Control Key. On the middle of this pin a cam is formed which controls the firing for "Single Fire," "Automatic Fire," or "Safe." On the outside of the pin head a stop is formed which engages with the beading on the Back Block (86) and prevents the lever being pushed too far down into the way of the Trigger. The other end of the Key (105) is drilled for the Spring (107) and Plunger (106), the end of which fits into the holes in the Back Block (86) and sets the Firing Gear in any of the three above-mentioned positions.

The Knob (108) is riveted to the Plunger (106).

Buffer. (*See Plate 17, Page 69.*)

A Spring Buffer is fitted in the rear end of the Back Block (86), in line with the centre line of the Gun, to absorb the surplus energy of recoil at the end of the recoil movement.

It consists of a Plunger (90), having a recessed head to house the Spring (91) and an elongated hole to take the Securing Pin (92) and allow longitudinal movement to the Plunger, a Securing Pin (92) and a Spiral Spring (91).

Barrel-Locking Key (Complete). (*See Plate 10, Page 62.*)

The Barrel-Locking device consists of the following parts :—

Barrel-Locking Key (80).

„	„	„	Handle (81) with Nut.
„	„	„	Knob (82) with Washer.
„	„	„	Plunger (83)
„	„	„	„ Nut (84).
„	„	„	Spring (85).

The Barrel-Locking Key (80) has a pin turned on one end to fit the holes prepared for it in the Receiver. This pin has a solid key formed near the shoulder for engaging in the groove in the hole in the Receiver (1) and small teeth are cut half way round for engaging with the teeth cut in the Gas Cylinder (9). The end of the stem is cut rectangular to take the Handle (81) and drilled up the centre to receive the Plunger (83) and Spring (85), a pin hole being drilled to retain the Plunger.

The Barrel-Locking-Key Handle (81) has a rectangular hole cut to receive the Key (80) with a pin on one side to take the knob, and a catch on the other side to engage in the notches on the left side of the Receiver. The Nut (84) for the Plunger (83) is permanently riveted to the Handle.

The Barrel-Locking-Key Knob (82) is fitted over the Handle and permanently riveted to it.

The Plunger (83) has a head at one end in which an elongated hole is cut for the securing pin to allow the necessary movement for releasing the Handle (81). It is screwed at the other end for the Nut (84).

The Spring is housed in the Key (80) and held by the head of the Plunger (83).

Barrel. (*See Plates 6 and 7, Pages 58 and 59.*)

The Barrel (55) is bored and chambered at the rear end for the cartridge and for the remainder of its length is bored and rifled. An Acme Thread is cut at its rear end, to take the Receiver (1) and the threads are interrupted to facilitate assembly. These interruptions are made unequal, so that the Barrel (55) can only be assembled in the Receiver (1) in the correct position. It has a collar near the rear end, the rear face of which bears against the front face of the Receiver (1) when the Barrel (55) is right home. This collar has a keyway cut in the top to accommodate the tongue on the Barrel-Stop Piece (56) and a keyway cut in the bottom to take the key on top of the Gas Cylinder (9). It is turned parallel in front and rear of the collar to take the Barrel-Stop Piece (56) and Handle (59). A half pin hole is drilled in front of the collar for securing the Barrel-Stop Piece (56) and a groove is cut for the Grub Screw (64) securing the Barrel-Handle Bracket (57), which secures the latter longitudinally, while allowing it radial movement. Two recesses are milled for the Handle Catch (58). Towards the muzzle it is turned parallel to take the Gas Block (69) and a half hole is drilled to take the Pin (74) securing the Gas Block (69), while a small gas hole is drilled here communicating from the bore to the Gas Block (69). At the muzzle end it is turned parallel to take the Fore-Sight Bracket (77) and two recesses are milled to take tongues on the latter, while it is screwed to take the Muzzle Tube (79). The Barrel is bevelled off at the rear right hand to clear the Extractor (12).

Barrel-Stop Piece. (*See Plates 7 and 17, Pages 59 and 69.*)

The Barrel-Stop Piece (56) is a ferrule with a tongue piece which fits into a recess in the top front of the Receiver (1) and is drilled for the Securing Pin (56a).

Barrel Handle. (*See Plates 7 and 17, Pages 59 and 69.*)

The Barrel Handle consists of the following parts:—

- Bracket (57).
- Catch (58) and Axis Pin (58a).
- Handle (59).
- Plunger (60).
- „ Nut (63).

Stop (61).

Grip (62).

Grub Screw (64).

Pin (65).

Nut (66).

Plunger Spring (67).

Catch Spring (68).

The Bracket (57) is lever shaped and is bored to fit the Barrel (55) at one end and has a single eye at the other end in which three slots are cut for engaging with the end of the Plunger (60). It is drilled and tapped for the Grub Screw (64) securing it to the Barrel and is milled out to receive the Catch (58). A hole is cut through the boss to admit the end of the Catch (58) and a hole is drilled for the Axis Pin (58a) for the latter, while a recess is milled to receive the end of the Catch Spring (68). Holes for lightening are drilled in the boss.

The Catch (58) is a lever pivoted in the middle. It has a pin formed on one end for engaging with the Barrel (55) and is milled at the other end to receive the end of the Catch Spring (68).

The Handle (59) is a steel tube, on one end of which is formed a double eye for attaching to the Bracket (57). It is bored to receive the Plunger (60) and Spring (67) and screwed to receive the Stop (61). At the top, a rectangular hole is cut to take the rectangular pin on top of the Plunger (60).

The Plunger (60) is turned to fit the bore of the Handle (59) and to take the Plunger Spring (67). It is screwed at one end to take the Nut (63) and a rectangular pin is formed on the other end which projects through the top of the Handle (59) and engages with the slots in the Bracket (57).

The Stop (61) is screwed to fit the Handle (59) and has a hole drilled to take the end of the Plunger (60).

The Grip (62) is of insulating material and is bored to take the Handle (59) and Nut (63).

The Grub Screw (64) secures the Bracket (57) to the Barrel (55).

The Pin (65) and Nut (66) secure the Handle (59) to the Bracket (57).

The Plunger Spring (67) holds the pin on the end of the Plunger (60) in engagement with the slots in the Bracket (57).

The Catch Spring (68) holds the pin on the end of the Catch (58) in engagement with the slots in the Barrel (55).

Gas-Regulating Device. (*See Plate 7, Page 59.*)

The Gas-Regulating Device consists of the following parts :—

- Gas Block (69).
- Pin Securing Gas Block (74).
- Gas Plug (70).
- Filling Piece (71).
- Gas Regulator (72).
- Gas-Regulator Plug (73).
- Spring (75) for Gas Regulator.

The Gas Block (69) is bored to fit the Barrel (55). A pin hole is drilled transversely for securing it to the Barrel, and a hole is drilled and tapped on the top for a Sling Eye (76) the end of which enters a hole in the Barrel (55) and forms additional security. A taper hole is bored from the bottom and screwed to take the Gas Plug (70), while a small gas hole is drilled at the top of this hole communicating with the gas hole in the Barrel (55) and a gas chamber is formed at the rear of the taper hole. A hole is drilled and tapped transversely to take the Gas Regulator (72) and Regulator Plug (70) and a small gas hole is drilled communicating from this hole to the Gas-Plug hole. The rear end has a spigot formed on it to take the Gas Cylinder (9) and is bored to receive the Piston (10). The front end has a boss formed on it and a tapered hole is bored, the small end of which is elongated vertically. A small hole is drilled near the Gas-Regulator hole to take the Gas-Regulator Spring (75).

The Gas-Block Plug (70) is a taper plug turned and screwed to fit the Gas-Block (69). It is slotted at the top to receive the Filling Piece (71) and the necessary ports are cut to lead the gas on to the end of the Piston and for the escape of the waste gas through the ports in the Gas Regulator (72).

The Filling Piece (71) is a flat piece which takes the form of the top of the Gas-Block Plug (70) and has a curved groove cut in it which leads the gas from the Barrel (55) to the gas chamber in the Gas Block (69).

The Gas Regulator (72) is a cylindrical plug with a closed end. It is screwed to fit the right side of the Gas Block (69) and has a collar and a hexagonal head. The collar has four grooves cut in it for engaging with the Gas-Regulator Spring (75), and the head has stamped on it " 0 ", " 1 ", " 2 ", and " 3 " corresponding to these grooves. Three port holes, of varying sizes, are drilled for the escape of gas from the gas chamber in the Gas Block (69) through the Gas Regulator (72) and so through the forward opening in the Gas Block (69).

The Gas-Regulator Plug (73) is a cylindrical plug screwed to fit the left side of the Gas Block (69) and has a collar and hexagonal head. A small gas escape hole is drilled through the head to the inside of the cylinder.

The Gas-Regulator Spring (75) is sprung into the hole prepared for it in the Gas Block (69) and engages with any of the four grooves cut in the collar of the Gas Regulator (72), thus securing the latter in any desired position.

Fore Sight.

The Fore Sight (78) is a " T " shaped piece and is dovetailed into the Fore-Sight Bracket (77). The latter is bored to fit the muzzle end of the Barrel and has two tongues which engage in grooves in the Barrel for fixing it radially. It is held in position longitudinally by the Muzzle Tube and has a pin hole drilled for a Pin (79a) which secures the Muzzle Tube (79) when screwed up.

Muzzle Tube. (See Plate 7, Page 59.)

A Muzzle Tube (79) is fixed to the muzzle end of the Barrel (55) for the purpose of concealing the flash. It is conical shaped and is screwed internally to fit the Barrel. Flats are cut on the outside for screwing up and a lug is provided in which a pin hole is drilled for a Pin (79a) to prevent the Muzzle Tube (79) unscrewing.

Gas Cylinder. (See Plate 13, Page 65.)

The Gas Cylinder (9) is bored to fit the Piston (10) and also acts as the Piston Guide. Its rear end fits into the front end of the Receiver, underneath the Barrel, and its front end is bored to fit over the spigot on the Gas Block (69). It has a key formed on the bottom rear end on

which small teeth are cut to engage in the teeth cut in the Barrel-Locking Key (80) and a key on the top which engages in the keyway in the front end of the Receiver (1) and in the Collar on the Barrel (55) and serves to lock the Barrel to the Receiver. It is turned on the outside, at the front end, to take the Bracket (142) for the front legs and is grooved to take the Pin (142a) securing this Bracket (142) to the Gas Cylinder (9), while allowing the Bracket to turn. Six small holes are drilled, staggered, near the front end to allow the escape of surplus gas.

Main-Spring Tube. (*See Plate 8, Page 60.*)

The Main-Spring Tube (137) houses the Main Spring (94). It is screwed at the front end to fit into the Back Block (86) and is permanently fixed therein. A slot is cut in the front end to admit the head of the Piston (10) when fully recoiled. At the rear end a square hole is cut to take the square on the Adjusting Screw (138) and it is screwed to take the Securing Screw (132). A slot is cut in the rear end, in which the head of the Retaining Screw (133) slides.

Adjusting Screw. (*See Plate 8, Page 60.*)

The Adjusting Screw (138) is for adjusting the initial compression on the Main Spring (94). It has a collar formed on the rear end, which butts up against the rear end of the Main-Spring Tube (137), a square which fits into the square hole in the Main-Spring Tube and a pin end which fits into the Securing Screw (132) for the Butt Plate (131). It has another collar which comes inside the Main Spring (94) and is screwed at the front end to take the Adjusting Nut (139).

Adjusting Nut and Spring Guide. (*See Plate 8, Page 60.*)

The Adjusting Nut (139) and Spring Guide (140) acts as a Nut and a protection for the thread on the Adjusting Screw (138). It is bored and screwed for the latter and has a head on the rear end which acts as a support for the rear end of the Main Spring (94). A small hole is tapped and a flat is cut in the head to accommodate the Retaining Screw (141), the head of which acts as a key in the slot in the Main-Spring Tube (137) and prevents the Adjusting Nut from turning.

Butt (Complete). (*See Plate 9, Page 61.*)

The Butt (complete) consists of the following parts:—

Butt (125), with Adjustable Butt-Rest Ferrule (125a).

Pistol Grips (134 and 135).

„ „ Screws (142) and Nuts (142a).

Butt Plate (131) and Retaining Screw (133).

„ „ Securing Screw (132).

Cocking-Rod Cover (120).

Bracket for Adjustable Butt-Rest Catch (127) (with screws).

Adjustable Butt-Rest Catch (129).

„ „ „ Axis Pin (130).

„ „ „ Spring (128).

Butt.

The Butt (125) is made of figured Walnut and is of the usual rifle-butt shape. It is bored the entire length, at the top, to take the Main-Spring Tube (137). It is recessed and grooved on the right side front to take the Cocking-Rod Cover (120) and shaped at the front end to fit the Back Block (86), while a pin hole is drilled to secure it to the Back Block (86). A hole is bored in the bottom rear to take the Adjustable Butt Rest and in line with this the right side is cut out to take the Adjustable Butt-Rest Bracket (127) and Catch (129). The rear end is shaped to take the Butt Plate (131).

Adjustable Butt-Rest Ferrule.

The Adjustable Butt-Rest Ferrule (126) is made of steel. It has a collar with saw cuts for a screwdriver, is bored to fit the Outer Screw on the Adjustable Butt Rest and is screwed a taper thread for screwing into the wood Butt (125).

Pistol Grips.

The Pistol Grips (134 and 135) are made of figured walnut and are keyed on to the skeleton frame of the Back Block (86) and are drilled and counterbored for Screws (136) and Nuts (136a) securing them to the latter.

Butt Plate.

The Butt Plate (131) is a plate bent to suit the end of the Butt. It has a gib at the top end which is bored to receive the end of the Main-Spring Tube (137) and drilled and countersunk to take the Securing Screw (132) which screws into the Main-Spring Tube.

Cocking-Rod Cover.

The Cocking-Rod Cover (120) is made of sheet steel and is channel shaped, being turned up on the edges to form keys for engaging in the grooves in the Butt.

Bracket for Adjustable Butt Rest.

The Bracket for Adjustable Butt Rest (127) is a thin plate bent to form a double eye to take the Adjustable Butt-Rest Catch (129). It is fitted into the recess in the Butt (125) and drilled for wood Screws, Axis Pin (130) and for the end of the Spring (128).

Adjustable Butt-Rest Catch.

The Adjustable Butt-Rest Catch (129) is a lever pivoted to the Bracket (127) by the Axis Pin (130). Just above the Axis Pin a hole is recessed to take the end of the Spring (120). The top end has a thumb press and the bottom end a catch which fits into the Adjustable Butt Rest and secures it to the Butt.

Adjustable Butt-Rest Catch-Spring.

This Spring (128) fits between the Bracket (127) and the Catch (129) and holds the latter in the normal position whether the Adjustable Butt Rest is in or out of position.

The Front Legs. (*See Plate 14, Page 66.*)

The Front Legs are used when the Gunner is firing in the prone position, but can be folded up and secured on the side of the Gun when he is firing from the shoulder or from the hip. They are secured to the front end of the Gas Cylinder and consist of the following parts :—

Bracket (142).

„ Securing Pin (142a).

Hinge (143).

Catches (144).

Axis Pin (145) and Nut (146), with Split Pin.

Hinge Pins (147).

Distance Piece (148).

Spring (149).

Outer Tube (150).

Inner Tube (151).

Feet (152).

Collar (153).

Screw (154).

Keep (155).

Bracket.

The Bracket (142) has a main boss which is bored to fit the front end of the Gas Cylinder (9) and is drilled for the Pin (142a) securing it to the Gas Cylinder. It has a double eye formed on the bottom, which is drilled for the Axis Pin (145) and has three grooves cut round each side for engaging the Catches (144). The grooves in the bottom are cut right through and allow the Legs to be fully open, while the grooves in the sides are only of sufficient depth to lock the Legs when folded up.

Hinge.

The Hinge (143) has a single eye, which fits into the Bracket (142), on which is formed a double eye, the single eye being drilled for the Axis Pin (145) and the double eye for the two Hinge Pins (147) and Tie Pin (147).

Catch.

The Catches (144) fit in the double eye of the Hinge (143) and are drilled to take the Hinge Pins (147). On top is a claw which engages in the grooves in the Bracket (142). It is cut away in the middle to take the Spring (149). The bottom end is turned a driving fit for the Outer Tube (150), a rivet hole being drilled for securing it to the latter.

Distance Piece.

A Distance Piece (148) is provided for the Tie Pin (147), underneath the Spring (149), and this Pin and Distance Piece also serve to prevent the Spring (149) from falling out.

Spring.

The Spring (149) fits between the two Catches (144) and keeps the Legs fully open and locked to the Bracket (142) when in use, or partially open and locked to the Bracket (142) when folded up.

Outer Tube.

The Outer Tube (150) is a piece of standard tube turned down at the bottom end to fit the Collar (153) and slotted out on one side to take the Keep (155) and give elasticity to this Tube for gripping the Inner Tube. A rivet hole is drilled at the top for fixing it to the Catch (144).

Inner Tube.

The Inner Tube (151) is a piece of standard tube which slides in the Outer Tube (150). At the bottom end it is turned to fit the Foot (152) and a rivet hole is drilled for securing the latter. A groove is cut partially through one side for engaging the Keep (155).

Feet.

The Feet (152) are spade shaped for fixing in the ground and have a boss set at a suitable angle and bored for the end of the Inner Tube (151). being fixed to the latter by a rivet.

Collar, Keep and Screw.

The Collar (153) is bored to fit the Outer Tube (150) and has a lug on one side which is cut through with a saw and drilled and tapped for the Screw (154).

The Keep (155) fits into this saw cut and engages in the groove in the Inner Tube (151) thus preventing the Inner Tube with the Foot being withdrawn entirely from the Outer Tube.

The Collar (153) is brazed on to the Outer Tube (150) and this Tube is nipped up on the Inner Tube by means of the Screw (154).

Adjustable Butt Rest. (*See Plate 9, Page 61.*)

For firing in the prone position at short ranges the two Front Legs generally give sufficient accuracy, but for firing at longer ranges a small Adjustable Butt Rest is necessary. It is easily slipped into a socket under the Butt of the Gun and just as easily detached. It consists of the following parts :—

Nut (156).

Outer Screw (157).

Inner „ „ (158).

„ „ Stop Screw (159).

Centre Guide (160).

„ „ Stop Pin (161).

Foot (162).

Pin (163) (securing Centre Guide to Outer Screw.)

Pin (164) („ Foot to Inner Screw.)

Nut.

The Nut (156) is screwed, at the top, an internal Acme left-hand thread for engaging the Outer Screw (157) and, at the bottom, an internal Acme right-hand thread for engaging the Inner Screw (158). It is knurled on the outside for a hand grip and is saw cut at the bottom, so that it can be made to grip on the Inner Screw.

Outer Screw.

The Outer Screw (157) is cut externally, at the bottom end, an Acme left-hand thread to fit the thread in the top of the Nut (156) and a collar is formed for butting against the Ferrule (126) in the Butt (125). It is turned at the top to fit the Ferrule (126) and socket in the Butt and coned to facilitate entry. A pin hole is drilled for securing the Centre Guide (160) and, just above this, three holes are drilled, at a slight upward angle and equally spaced, to take the pin on the Catch (129). It is bored at the top to take the Centre Guide (160) and at the bottom to admit the Inner Screw (158).

Inner Screw.

The Inner Screw (158) is cut externally, its whole length, an Acme right-hand thread to fit the thread in the bottom of the Nut (156). It is bored internally, its whole length, to fit the Centre Guide (160). A hole is drilled at the bottom for the Pin (164) securing the Foot (162) and a hole is drilled and tapped at the top for the Stop Screw (159).

Stop Screw.

The Stop Screw (159) is screwed into the Inner Screw (158) and has a pin end which fits into the keyway in the Centre Guide (160).

Centre Guide.

The Centre Guide (160) has a keyway cut the entire length. It has a hole drilled in the top for the Pin (163) securing it to the Outer Screw (157) and a hole drilled in the bottom for a Stop Pin (161) which comes against the pin end of the Stop Screw (159) and prevents the Inner Screw (158) coming off the Centre Guide (160).

Foot.

The Foot (162) is in the form of a circular cup-shaped disc, of which the vertical leg is drilled for the Pin (164) securing it to the Inner Screw (158).

Magazine. (*See Plate 11, Page 63.*)

The Magazine consists of the following parts:—

Magazine Case (165).

„ Platform (167).

„ Top Plate (168).

„ Spring (166).

The Magazine Case (165) is a rectangular pressed steel case of curved shape, usually constructed to carry 30 rounds of Ammunition. It has internal grooves pressed in each side to take the side projections on the Platform (167) and holes are cut through each side, at the bottom, to allow these projections to come through and engage the Breech-Block Catch (36). The bottom end is open, but partly curved over to hold the cartridges. A lip is formed at the front side for engaging the lip on the Receiver (1) and on the rear side for engaging the Magazine Catch (25).

The Magazine Platform (167) is a sheet steel pressing. It has a projection on the underside which ensures the cartridges taking up automatically a staggered position in the Magazine when they are fed into the Case. It is turned up at the front to prevent it tilting over, and a projection is formed on the rear left-hand side which butts against the Top Plate (168) and ensures that the capacity of the Case is just 30 rounds. On the sides, projections are formed which engage with the Breech-Block Catch (36) and, when the last Cartridge has been displaced from the Magazine, the Catch (36) holds the Breech Block (11) in the open position until the empty Magazine has been removed. Clips are formed on the inside to secure the end of the Spring (166).

The Magazine Top Plate (168) is a flat steel pressing which is clipped into the top of the Case (165).

The Magazine Spring (166) is a spiral spring of round steel wire, curved to suit the case and controls the Platform (167). Its bottom end is slipped into the clips on the Platform and the Spring and Platform are assembled together.

The parts are assembled from the top and the Magazine Case is charged from the bottom.

RECOILING PARTS.

The recoiling parts consist of the following :—

Breech Block (complete).

Piston (10).

Main Spring (94).

The Breech Block (complete) consists of :—

Breech Block (11).

Extractor (12).

„ Plunger (13).

„ Spring (14).

Firing Pin (18).

„ „ Spring (19).

„ „ Retaining Pin (20).

Feed Piece (15).

„ „ Spring (16).

„ „ Axis Pin (17).

Breech Block. (*See Plate 13, Page 65.*)

The Breech Block (11) is a long rectangular block in which the cartridges are held by the Extractor (12) and which slides in the Receiver (1). It is milled out on the rear underside to take the head of the Piston (10), two inclined grooves being formed inside in which two Cams (10b) on the Piston Post (10a) move in order to lock and unlock the Breech Block (11) from the Locking Shoulder (109).

A cam groove is milled in the front underside, the rear end of which, when it comes into contact with the Breech Block Cam (6) in the Receiver (1), lifts the Breech Block (11) to lock the rear end of it to the Locking Shoulder (109).

On the right forward side, it is cut out to take the Extractor (12) and projections are formed on this side for housing the Extractor (12) and the Extractor Plunger (13). The inside of the projection for housing the Extractor (12) is cut away at an angle to engage with a corresponding angle on the front of the Extractor, so that when the Breech Block recoils the resolved pressure between these two angular faces causes the claw on the front of the Extractor (12) to move inward and grip tightly the

empty cartridge case for extraction. This hole for the Extractor (12) is bevelled away toward the centre, at the front, to enable the Extractor to be inserted easily from this end.

On the left side, a cam groove is cut at the rear end to accommodate the rear end of the Ejector and a pocket groove is cut to accommodate the rear end of the Ejector when the rear end of the Breech Block is raised.

On the same side, at the front end, a groove is cut to accommodate the front end of the Ejector (21) when in the ejecting position.

The top is cut away at an angle to clear the bottom of the Magazine Case (165) and the rear projection at the top is radiused on the back face and bevelled off at the top rear corner to accommodate the Locking Shoulder (109), these parts being hardened and ground up. The front corners of this rear projection are cut away on each side to clear the Breech-Block Catch (36). Two shallow grooves are cut along the top to clear the nose of the cartridges in the magazine and the front end is recessed to take the Feed Piece (15) and Feed Piece Spring (16) and drilled transversely to take the Feed-Piece Axis Pin (17). Recesses are cut in the top front, one at each side, to take the Breech Block Catch (36) and "V" grooves are cut near these to clear the bottom of the magazine.

A hole for the Firing Pin (18) and Spring (20) is drilled longitudinally and centrally in the front end and a hole for the Retaining Pin (19) is drilled and tapped transversely.

The front end of the Breech Block is cut out to take the cartridge, the top part being radiused out to give a lead to the cartridge.

A small gas-vent hole is drilled in the bottom front end connecting with the Firing-Pin hole.

Extractor, Plunger and Spring. (*See Plate 13, Page 65.*)

The Extractor (12) is mounted in the front right-hand side of the Breech Block (11). It is bored to receive the Plunger (13). At the inside front end, it has a claw which clips the rim of the cartridge on to the front end of the Breech Block, and it is cut away at an angle to fit against the corresponding angle on the Breech Block.

The Plunger (13) fits into the Extractor (12) and has a head which fits into the housing provided for it on the Breech Block and holds it in position.

The Spring (14) is a strong steel spiral Spring which is housed on the Plunger (13) between its head and the end of the Extractor (12), thus holding the Extractor (12) in position with the inclined face on the front of the Extractor engaged with the inclined face on the Breech Block, while allowing the Extractor the necessary movement for gripping the empty cartridge case when extracting and the necessary release when ejecting.

Firing Pin, Spring and Retaining Pin. (*See Plate 13, Page 65.*)

The Firing Pin (18) is mounted centrally in the front end of the Breech Block. It is a round pin with a head on the rear end to prevent it running too far forward and a pin point at the front end which projects through the front end of the Breech Block.

The Spring (20) is a small spiral Spring placed over the Firing Pin and housed in the Breech Block between a shoulder on the latter and a shoulder on the Firing Pin. Its function is to hold the Firing Pin in its normal position at the rear.

The Retaining Pin (19) is a round screwed pin which is screwed into the Breech Block and holds the Firing Pin (18) and Spring (20) in position.

Feed Piece, Spring and Axis Pin. (*See Plate 13, Page 65.*)

The Feed Piece (15) is a small lever mounted in the top front end of the Breech Block (11). It is hinged to the latter by the Axis Pin (17), so that it can deflect downward when passing beneath the cartridge in the magazine. Two lugs are formed on it, one on each side, which butt against shoulders on the Breech Block, thus taking the shear off the Axis Pin (17). A small hole is recessed in the front underside to take the end of the Spring (16) which comes between the Breech Block and the Feed Piece and holds the latter in the up position ready to engage the base of the cartridge when the Breech Block (11) commences its return to the firing position.

Piston. (*See Plate 13, Page 65.*)

The Piston (10) is chiefly supported by the Gas Cylinder (9) in which it travels backward and forward during the working of the gun. It has an enlarged end at the rear on which is formed a Piston Post (10a) carrying two Cams (10b) which engage in the inclined grooves inside the Breech Block (11) ; an Actuating Lug (10c) which engages with the bottom rear end of the Breech Block to actuate the latter on the forward movement ; two keys, one on each side, which work in guides in the Receiver (1), that on the right side being formed into a catch at its front end to engage a similar Catch (114) on the Cocking Rod (111). A flat is cut on the rear underside and a Catch (10d) formed to engage the Trigger Sear (96) which holds the Piston (10) in the recoiled position.

A spigot is formed on the rear end to centre the front end of the Main Spring (94). A large radius is formed where the diameter changes, but the top part is cut to form a shoulder for engaging with a Stop (7) in the Receiver (1).

Slightly enlarged diameters are formed on the front end to fit the bore of the Gas Cylinder (9) and three annular clearing grooves are cut in the front end. It is slightly cupped out at the front end and this tends to catch and hold the deposits from the gases and so helps to keep the Gas Cylinders clean.

Main Spring. (*See Plate 11, Page 63.*)

The Main Spring (94) is a strong spiral Spring of some length, which is housed in the Main-Spring Tube (137) and butts against the Nut (139) at the rear end and against the rear end of the Piston (10) at the front end. Its chief function is to return the recoiling parts to the firing position, but it also assists in absorbing the shock of recoil.

ACTION OF THE MECHANISM.

(See Plates 17 and 18, Pages 69 and 70.)

To Prepare for Firing.

- (1) See that the Fire-Control Key (105) is set to "safe."
- (2) Open the Front Legs.
- (3) Pull the Magazine-Catch Slide (34) to the rear, raise the Magazine-Catch Flap (35), and open the Magazine-Opening Cover (39).
- (4) Cock the gun by drawing the Cocking Handle back as far as it will go, against the action of the Main Spring (94).
- (5) Return the Cocking Handle to the forward position.

Note.—Misfires are liable to occur if the gun is fired with the Cocking Handle left in the rear position.

- (6) See that the Gas Regulator (72) is properly set. The normal setting is "No. 2."
- (7) Set the Fire-Control Key (105) to "single fire" or "automatic fire" as required.
- (8) See that the Magazine is properly filled.
- (9) Place the magazine into the Magazine Opening on top of the Receiver, front end first, and snap it down at the rear end into the Magazine Catch (25) in the Receiver.

Note.—This operation can be performed with the Breech either open or closed.

The gun is now "cocked" and ready for firing.

Cocking Action.

The normal position of the recoiling mechanism is shown in Plate 18, Fig. 1, where the Piston (10) and Breech Block (11) are right forward in the firing position, and the breech is closed. In this position, the Catch (114) on the front end of the Cocking Rod (111) is engaged in the Catch on the front end of the key on the right side of the Piston (10), and when the Cocking Handle is drawn to the rear it draws with it the Piston (10) and Breech Block (11), at the same time compressing the Main Spring (94). As the Piston moves to the rear, the Cams (10b) on the Piston Post (10a) engage with the bottom inclined surface on the

inside of the Breech Block (11), and the rear end of the latter is drawn down clear of the Locking Shoulder (109), while the rear end of the Piston (10) comes into contact with the inside rear face of the Breech Block (11).

The Bent of the Actuating Lug (10c) on the Piston then engages with the Bent on the rear bottom end of the Breech Block (11), and Piston (10) and Breech Block (11) are locked together and travel to the rear in the "cocked" position, being finally arrested by the buffer. The Piston (10) and therefore the Breech Block (11) are held in the cocked position at the rear by the Bent of the Trigger Sear (96) engaging in the Bent of the Catch on the bottom of the Piston.

The Cocking Handle can now be returned to the forward position without interfering with the mechanism.

To Fire.

Sight the gun and pull the Trigger (95).

For "single-shot firing" pull the Trigger and release each time.

For "automatic firing" pull the Trigger back and hold it there, when the gun will continue to fire until the magazine is empty.

Should a stoppage occur, it will be necessary to use the Cocking Handle again, always returning it to the forward position where it remains while the gun is being fired.

Forward Movement.

When the Trigger (95) is pressed to fire, the step on the Trigger comes into contact with the Trigger-Sear Pawl (99) and raises the rear end of the Trigger Sear (96), thus depressing the front end of the latter and releasing its Bent from the Bent of the Catch (10d) on the underside of the Piston (10), and allowing the Piston (10), and with it the Breech Block (11), to run forward under the action of the Main Spring (94).

As the Breech Block (11) moves forward, the Feed Piece (15) rises, under the action of its spring, as soon as it leaves the Locking Shoulder (109) and engages behind the rim of the bottom cartridge in the magazine, which is then pushed forward in the continued movement until the Bullet comes into sliding contact with the Bullet-Lead Cam (4)

in the Receiver (1) and the cartridge is guided down into the Breech Block, behind the claw on the Extractor (12) and rammed into the chamber of the gun.

As the Breech Block (11) approaches the end of its travel, the cam cut in its front underside rides over the Cam (6) in the Receiver (1) and the front end of the Breech Block (11) being held by the Receiver, acts as a fulcrum and the rear end is lifted to disengage the Bent of the Actuating Lug (10c) from the Bent on the rear bottom end of the Breech Block (11).

The Breech Block (11) is now fully home in the Forward position and the Piston (10) is now free to continue its movement. As the Piston moves forward, the Cams (10b) on top of the Piston Post (10a) engage the upper inclined surfaces on the inside of the Breech Block, thus further lifting the rear of the latter to engage in front of the Locking Shoulder (109), and the Cams (10b), riding under the parallel surfaces inside the Breech Block, lock the latter in the firing position while the Piston travels on the Piston Post (10a), striking the Firing Pin (18) to explode the cartridge in the chamber of the Gun, and finally coming to rest against the Piston Stop (7) in the Receiver (1).

Recoil Movement.

When the gun has been fired, the pressure of the gases, generated by the explosion of the charge, acts on the base of the bullet and drives the bullet forward, leaving the empty case behind. When the bullet has passed the gas hole in the Barrel, some of the gases instantly escape through the Gas Block and impinge on the front end of the Piston, driving the latter to the rear against the pressure of the Main Spring (94).

The first part of the rearward movement of the Piston releases the Firing Pin (18) and the Firing-Pin Spring (20) withdraws the Firing Pin from the empty cartridge case. During this time, the rear end of the Breech Block is still held in the upward position by reason of the Cams (10b) on the Piston Post (10a) still being engaged with the upper cam faces on the inside of the Breech Block and the Breech Block (11) is, therefore, still locked. It will thus be seen that the gases act on the Piston (10) before any unlocking of the Breech Block takes place.

As the Piston (10) continues its movement to the rear, the Cams (10b) on the Piston Post (10a) break contact with the upper inclined cams on the inside of the Breech Block and engage with the lower inclined cams on the inside of the Breech Block, thus bringing down the top rear end of the latter clear of the Locking Shoulder (109) and when the rear end of the Piston Post (10a) comes into contact with the inside rear end of the Breech Block (11), the Bent on the Actuating Lug (10c) engaging with the Bent on the bottom rear end of the Breech Block (11), the Piston and Breech Block are locked together and run to the rear to be finally arrested by the Buffer at the end of recoil.

During the final movement of the Breech Block (11) to the rear, the cam on the rear end of the Ejector (21) which is attached to the Receiver, is moved outward by the cam on the left side of the Breech Block and the toe on the front of the Ejector (21) is moved inward behind the base of the cartridge case held in the Breech Block (11) by the Extractor (12). As the Breech Block (11) continues its movement to the rear the empty cartridge case is suddenly arrested by the toe on the front of the Ejector (21) and is jerked out of the face of the Breech Block and through the Ejection Slot.

In the meantime, the front of the Cartridge Feed Piece (15) is deflected downward when passing beneath the magazine, only to rise again under the action of its Spring (16), behind the base of the next cartridge in the magazine.

During recoil the Main Spring becomes fully compressed and has stored up sufficient energy to carry the recoiling parts forward into the firing position on the next forward movement.

GENERAL REMARKS ON THE ACTION OF THE MECHANISM.

In single shot Firing, when the Trigger (95) is pulled, the Piston (10) and Breech Block (11) fly forward. On release of the Trigger (95) the Bent of the Trigger Sear (96) rises and, on the return of the Piston, is pushed down by the Piston Catch (10c) until the Bent of the Trigger Sear (96) engages with the Bent of the Piston Catch and the Breech Mechanism is held to the rear.

In automatic firing, however, the Trigger (95) is held pressed back and the Bent on the Trigger Sear (96) is held clear of the Piston ; in which case the recoiling parts, at the end of their recoil, instantly return to the firing position, under the action of the Main Spring (94) and the gun continues to fire as long as the Trigger is held and there are cartridges in the magazine.

When the last cartridge in each magazine has been fed into the Barrel, two lugs on the Magazine Platform press down on the Breech Block Catch (36) causing it to engage in notches in the Breech Block (11), thus holding the latter back in the open position.

The action of removing the empty magazine disengages the Breech Block Catch (36) from the Breech Block (11) and allows the mechanism to move slightly forward until it is arrested by the Bent on the Trigger Sear (96). The gun is, therefore, ready to fire again, without re-cocking, as soon as another loaded magazine has been placed in position in the Receiver.

ACTION OF THE FIRE CONTROL KEY IN THE TRIGGER GEAR.

(See Plate 19, Page 71.)

The Fire Control Key (105) has a cam formed on its stem which controls the Trigger Gear in three positions, namely :—

- (1) For “ single-shot fire.”
- (2) For “ automatic fire.”
- (3) For “ safe.”

To Set for “Single-Shot Fire.”

Place the end of the Plunger (106) contained in the Knob (108) of the Fire Control Key (103) in its middle hole in the Back Block (86). This brings the cam on the stem of the Fire Control Key (105) clear of the nose on the top front of the Trigger, and the Trigger can be moved far enough to bring its step into contact with the bottom of the Trigger Sear Pawl (99), thus lifting the rear end of the Trigger Sear (96) and depressing the front to disengage the Bent of the Trigger Sear (96) from the Bent of the Catch (10d) on the Piston. During this action, the Trigger-Sear Spring (102) pushes the Trigger Sear (96) to the rear on its Trunnion until the Trigger Sear Pawl (99) slips off a step formed on the Trigger (95), thus allowing the front end of the Trigger Sear (96) to rise and re-engage with the Catch (10d) on the Piston (10) when the latter returns.

To repeat, release the Trigger (95) and pull again.

To Set for “Automatic Fire.”

Place the end of the Plunger (106) contained in the Knob (108) of the Fire Control Key (105) in its top hole in the Back Block (11). This brings the cam on the stem of the Fire Control Key (105) into contact with a tooth on the underside of the Trigger Sear (96) and forces the latter forward, thus keeping the Trigger Sear Pawl (99) engaged with the step on the Trigger (95). A continuous pull on the Trigger (95) holds the Trigger Sear (96) well out of engagement with the Catch (10d) on the Piston (10), which is free to travel backward and forward to load and fire the gun so long as cartridges remain in the magazine.

To Set for "Safe."

Place the end of the Plunger (106) contained in the Knob (108) of the Fire Control Key (105) in its bottom hole in the Back Block (86). This brings the cam on the stem of the Fire Control Key (105) into contact with a projection on the top front of the Trigger (95) and the latter cannot be pulled. The front end of the Trigger Sear (96) is, however, free to descend, to allow the gun to be "cocked" in the event of the Fire Control Key (105) being set to "safe" when the breech is closed.

For various positions of the Fire Control Key (105), *see* Plate 19.

(Fig. I)—Fire Control Key (105) set for "single-shot fire." Trigger (95) in the normal position.

(Fig. II)—Fire Control Key (105) set for "single-shot fire." Trigger partially pulled and Trigger Sear (96) just released. Trigger Sear Pawl (99) has not yet tripped.

(Fig. III)—Fire Control Key (105) set for "single-shot fire." Trigger fully pulled and arrested by the cam on the stem of the Fire Control Key (105). The Trigger Sear (96) has returned to normal position, because the Trigger Sear Pawl (99) has tripped owing to the longitudinal movement of the Trigger Sear (96) to the rear.

(Fig. IV)—Fire Control Key (105) set for "automatic fire." Trigger (95) pulled and Trigger Sear (96) released. The latter cannot move longitudinally to the rear because the cam on the stem of the Fire Control Key (105) is engaging the tooth on the underside of the Trigger Sear (96).

(Fig. V)—Fire Control Key (105) set to "safe." The Trigger (95) cannot be pulled, because the cam on the stem of the Fire Control Key (105) is in contact with the projection on the top front of the Trigger (95).

GENERAL INSTRUCTIONS.

A Spare Barrel is provided, and it is recommended that the Barrels should be changed after firing 240 Rounds rapidly.

The first Barrel, although still warm, may be replaced after firing 240 Rounds with the second Barrel.

If a spare Barrel is not available, Fire may be continued with the same Barrel. This will cause undue wear in the bore, but will not be detrimental to the functioning of the Gun.

To Dismantle the Gun.

Proceed in the following order :—

- (1) See that the Breech Mechanism is closed.
- (2) Detach the Butt.
- (3) Slide out the Breech Mechanism and separate it.
- (4) Remove the Barrel.
- (5) Remove the Gas Cylinder.

Detailed instructions for performing the above operations :—

- (1) Press the Trigger (95) to close the Breech.
- (2) Press out the Butt-Securing Pin (125a) with the nose of a Cartridge.

To detach the Butt, bend it upwards and unhook it from the Receiver.

Remove the Main Spring.

- (3) Remove the Mechanism by a sharp backward pull of the Cocking Handle. To separate the Piston from the Breech Block, draw the former forward and unhook it.

Push the Cocking Rod (111) forward.

- (4) To remove the Barrel (55), take hold of the Barrel-Handle Grip (62), release the Catch (58) and turn the Barrel Handle from the position shown in the Frontispiece and Plate 1 to the position shown in Plate 15, Fig. 1, allowing the Catch (58) on the Barrel Handle to snap in again to secure the Handle in this position. Holding the Barrel Handle with the right hand, take hold of the Barrel-Locking-Key Knob (82) with the left

hand, pull the Barrel-Locking-Key Catch horizontally to the rear to unlock it from the Receiver and turn it downwards to the position "b" shown on Plate 15, Fig. 1. This unlocks the Gas Cylinder (9) from the Barrel (55) by withdrawing it to the rear, thereby releasing the key on top of the rear of the Gas Cylinder (9) from the keyway in the collar of the Barrel and releasing the front end of the Gas Cylinder (9) from the Gas Block (69).

Now give the Barrel an eighth of a turn to the right to disengage the Barrel Screw from the Receiver Screw.

The Barrel can then be pushed forward, as shown in Plate 15, Fig. 2, and removed from the Gun.

- (5) To remove the Gas Cylinder (9) turn the Barrel-Locking-Key (80) from position "b" to position "c" as shown in Plate 15 until the Handle (81) snaps into the upper notch in the Receiver. The Gas Cylinder can then be removed by a slight forward push.

The Barrel-Locking Key (80) should be left in this position, as the teeth on its stem are in the right position for engaging in the first tooth on the Gas Cylinder (9) on re-assembly.

The Front Legs need not be removed from the Gas Cylinder.

To Assemble the Gun.

- (1) To assemble the Gas Cylinder (9), the Barrel-Locking-Key Handle (81) should be in its upper notch in the Receiver, that is, in position "c," as shown in Plate 15. Push the Gas Cylinder (9) into the front end of the Receiver (1), until the first tooth on the Gas Cylinder (9) engages with the teeth in the stem of the Barrel-Locking Key (80).

Release the Barrel-Locking Key Handle from its top notch in the Receiver and turn it, from position "c" to position "b," as shown in Plate 15. This draws the Gas Cylinder (9) to the rear, in a position ready to receive the Barrel (55).

- (2) To assemble the Barrel (55), the Barrel-Locking-Key (80) should be in position "b" as shown on Plate 15.

Take hold of the Barrel Handle with the right hand and the Gun with the left, the Handle being at the top, an eighth of a turn from the vertical position, and enter the Barrel into the Receiver, as shown in Plate 15, Fig. 2, until the rear face of the Barrel collar butts against the front face of the Receiver. Then turn the Handle and Barrel anti-clockwise, an eighth of a turn to engage the Barrel Screw with the Receiver Screw.

Now take hold of the Barrel-Locking-Key (82) with the left hand and turn it from position "b" to position "a" as shown in Plate 15, allowing the Handle (81) to snap into the lower notch in the Receiver. This movement sends the Gas Cylinder (9) forward, the Key on the top rear end of it engaging in the Keyway in the Barrel Collar and the front end engaging with the Spigot on the Gas Block (69). The Barrel is now locked.

Release the Handle Catch (58) and turn down the Handle to the normal position underneath the Barrel, as shown in the Frontispiece and Plate 1.

- (3) To assemble the Breech Mechanism, place the Piston Post (10a) inside the Breech Block (11) and enter them together in the Receiver (1). When they are entered, push the Breech Block (11) slightly forward (otherwise these two parts will jam) and then Piston and Breech Block can be pushed right home together.
- (4) To assemble the Butt, first place the Main Spring (94) into the Butt. Take hold of the Receiver (1) with the left hand and the Butt (125) with the right and enter the front end of the Main Spring (94) on the Spigot on the rear end of the Piston (10). Then hook the Back Block (86) into the Receiver (1), press the Back Block and Butt downwards and push in the Butt-Securing Pin (125a).

The foregoing operations for "Dismantling" and "Assembling" are sufficient to permit cleaning in the field, but if further dismantling is necessary proceed as follows:—

To Dismantle the Trigger Gear.

- (1) Remove the Butt.
- (2) Turn the handle of the Fire-Control Key (105) downwards until the Key is released from its groove in the Trigger-Guard Plate (93), then remove the Fire-Control Key (105).
- (3) Take off the Trigger-Guard Plate (93) by lifting its rear end outward with the combination tool.
- (4) Push out the Trigger-Sear Axis (98) from the frame and remove the Trigger Sear (96) together with Trigger-Sear Pawl (99), Trigger-Sear-Pawl Pin (100) and Trigger-Sear-Pawl Spring (101), as well as the Trigger-Sear Spring (102).
- (5) Take out the Trigger Spring (103) with the combination tool, push the Trigger-Axis Pin out of the Frame and remove the Trigger (95).

To Assemble the Trigger Gear.

- (1) Insert the Trigger (95) in the frame and place the Trigger Spring (103) in position with the combination tool.
- (2) Place the Trigger-Sear Spring (102), the Trigger Sear (96) with Trigger-Sear Pawl (99), Pawl Pin (100), Pawl Spring (101) and the Trigger-Sear Axis (98) in position in the frame.
- (3) Place the Trigger-Guard Plate (93) in position by inserting the lip on the front end under the frame and snapping it down at the rear end.
- (4) Insert the Fire-Control Key (105) in the frame with its handle downwards, then turn it upwards to the working position to lock the Trigger-Guard Plate (93) to the frame.
- (5) Attach the Butt.

To Dismantle the Extractor.

Engage the blade of the combination tool behind the head of the Extractor Plunger (13), and slowly lever it forward, when the Extractor Plunger (13) and Spring will come out to the rear and the Extractor (12) can be removed from the front.

As the Extractor Spring (14) exerts considerable pressure, care should be taken that the parts do not fly out as they leave the Breech Block (11).

To Assemble the Extractor.

Insert the Extractor (12) in the Breech Block (11) from the front end, with the inclined guide on the front of the Extractor engaging the inclined guide on the inside of the front of the Breech Block, and force the Spring (14) and Plunger (13) forward and downward into the pocket.

To Dismantle the Ejector.

First cock the Gun, then with the fore-finger of the right hand inserted in the magazine opening, push on the front end of this Ejector (21) when the cam on the rear end of the Ejector will then lever out the rear end of the Ejector Cover (22) which can then be slid to the rear by the fore-finger and thumb of the left hand and removed.

To Assemble the Ejector.

Insert the Ejector (21), rear end first, and engage the trunnions, then fold down. Slide the Extractor Cover (22) into its dovetail until the rear end snaps down into the locked position.

To Dismantle the Firing Pin.

The Breech Block (11) must first be removed from the Receiver (1). Then remove the Retaining Pin (19) in the Breech Block (11), which secures the Firing Pin (18) and shake out the latter and its Spring (20).

To Assemble the Firing Pin.

Insert the Firing Pin (18) and Spring (20) in the Breech Block (11) and screw in the Retaining Pin (19).

Note.—The Extractor (12) and Ejector (21) can be “dismantled” and “assembled” without stripping the other parts of the gun, the mechanism must be stripped, however, to replace the Firing Pin (18).

To Dismantle the Cocking Rod.

Remove the Butt (125).

Release the Catch (122) and remove the Ejection-Slot Cover (121).

Remove the Cocking-Rod-Claw Split Pin, Pin (116) and Claw (115).

Slide out the Cocking Rod.

To assemble, reverse the foregoing operations.

Functioning of the Gas Regulator.

The function of the Gas Regulator is to provide a ready means of adjusting the gun to varying climatic conditions. By the aid of the combination tool, the Regulator may be turned to any one of four positions, "0," "1," "2" and "3." This enables any one of the three gas-escape holes to be brought into alignment with an escape vent connecting with the Gas Block, and in this way provides a variable outlet for surplus gas when too much power is being used.

When the Regulator (72) is set at "0" there is no escape of gas, the full pressure of which is then acting on the front end of the Piston (10), but when set at "3" the largest escape hole is brought into use and causes a considerable drop in both gas pressure and violence of recoil.

To adjust the Regulator (72) place a full magazine on the Gun and fire single shots at 45° depression. Turn the Regulator with the combination tool until the recoil is only just sufficient to fire single shots. The normal adjustment is with the Regulator set at "2," when the Gas Block is clean.

To Load the Magazines.

Place a full Charger Guide over the mouth of the magazine and insert the clip of Cartridges. Press the Cartridges down into the magazine and repeat until a full load has been inserted.

When the Cartridges are not in Chargers, insert them into the Magazines one at a time. After filling the Magazine, press the Cartridges as far down as they will go to make sure they rise smartly again. If the action is sluggish, the Magazine is faulty.

To Change the Magazines.

Release the Trigger (95), then release the empty Magazine by pushing the Magazine-Catch Flap (35) forward and remove the empty Magazine. Mount a full Magazine and the Gun will fire as soon as the Trigger (95) is pressed.

Use of the Front Legs.

For light automatic firing where the Legs are necessary, press the Legs together to disengage them from the folded position against the Barrel and swing them downwards until they open out by the action of the Spring and the catches snap in to secure them in the open position.

To fold up the Front Legs, reverse the foregoing operations.

Points to be Observed before Firing.

- (1) Examine the Barrel and see that the bore is clear. This can be most easily done by removing the Barrel.
- (2) See that the Gas Regulator is set to normal.
- (3) See that the necessary Spare Parts are close at hand in case of need.
- (4) See that the Magazines are correctly filled.
- (5) See that the Fire-Control Key is set to "single-shot fire" or "automatic fire" as required.
- (6) See that the Gun is lightly oiled and completely assembled.

Points to be Observed during Firing.

No special points need be observed.

Points to be Observed after Firing.

- (1) Remove the Magazine.
- (2) Press the Trigger.
- (3) Fold down the Rear-Sight Stem.
- (4) Close the dust Covers and fold down the Magazine-Catch Flap.
- (5) Oil the Bore.

CARE AND MAINTENANCE OF THE VICKERS-BERTHIER LIGHT MACHINE GUN.

It is very important that the bore of the Barrel should be cleaned and oiled immediately after firing.

Cleaning and Lubrication.

When cleaning the Gun, turpentine or oil should be used. Emery cloth, or any abrasive substance should NOT be used.

Before assembling the Gun it is a good plan to try the parts separately in their places, to see that they work freely.

The Gun should be lubricated with a thin mineral oil which will not cease to flow when exposed to low temperatures. It must be free from acid, dirt, suspended matter and water.

Examination of Components after Practice.

The Breech Block (11) and Piston (10) should be taken out and the Breech Block examined to see that all its parts are in working order.

It will not be necessary to dismantle the Breech Block to do this.

Monthly Examination.

The Gun must be thoroughly examined once a month and left in a properly lubricated and serviceable condition.

The following parts should, therefore, be removed, properly cleaned and re-oiled or greased :—

The Breech Block (11).

The Piston (10).

The Barrel (55).

STOPPAGES.

The mechanism of this Gun is so simple and is composed of so few parts that, under normal conditions and with a highly trained Gunner, stoppages are of rare occurrence ; but when they do occur they can be effectively and expeditiously dealt with by following the instructions given below in the Table of Temporary Stoppages.

TEMPORARY STOPPAGES.

The following table of temporary stoppages gives a clear indication of the cause of and "remedy" for each stoppage.

Column 1.

Gives the approximate position of the Breech Block for each stoppage.

Column 2.

Gives the cause of the stoppage.

Column 3.

Gives the "remedy" necessary to prevent a recurrence of the stoppage.

TABLE OF TEMPORARY STOPPAGES.

1	2	3
Approx. Position of Breech Block.	Cause.	"Remedy."
Stoppage No. 1. <i>See Plate 16, Page 68.</i> About $\frac{1}{4}$ of the Breech Block seen through the Ejection Slot.	(1) Magazine incorrectly put on. Bullet point unable to pass under the Bullet Lead Cam. NOTE.—This stoppage is due to lack of elemen- tary training.	(1) Cock the mechanism. Re- move the magazine. See that the first cartridge is correctly positioned. Replace the magazine and continue firing.
	(2) Interlocking Cartridge Rims. This is due to the second round in the magazine being abnor- mally short.	(2) Cock the mechanism. Remove the magazine. Remove the short round from the magazine, or push it back to the correct position with the rim behind that of the first round. Replace the maga- zine and continue firing.

TABLE OF TEMPORARY STOPPAGES—continued.

1	2	3
Approx. Position of Breech Block.	Cause.	" Remedy."
<p>Stoppage No. 2. See Plate 16, Page 68. About $\frac{1}{2}$ of the Breech Block seen through the Ejection Slot.</p>	<p>(1) Failure to ram. The first round is not cleared from the magazine, due to friction in the gun mechanism or considerable sand inside the magazine.</p> <p>(2) The first round in the magazine is out of place before the magazine is put on the gun—due to Gunner No. 2 not doing his job. In this case the round may fall into the Breech opening or the Bullet end drop out of alignment with the chamber, causing a misfeed.</p> <p>(3) Failure to eject—the fired cartridge case remaining in the Receiver well, thus preventing the next cartridge from being properly fed forward.</p> <p>(4) Misfeed—the point of the Bullet not entering the mouth of the chamber.</p> <p>(5) Failure to extract—the fired case remaining in the chamber with the bullet point of the next round fed on to it. Probable cause — broken Extractor.</p>	<p>(1) [a] Cock the mechanism and fire. If repeated, change the magazine, which should be cleaned out before further use. [b] Friction in Gun Mechanism can be largely overcome by oiling the Piston through the top opening.</p> <p>(2) Cock the mechanism. Remove the magazine and correct the displaced cartridge, or remove the loose Round from the open mechanism. Replace the magazine and continue firing.</p> <p>(3) Cock the mechanism. [a] Remove the damaged round and empty cartridge case from the Receiver. Replace the magazine and carry on firing. [b] If repeated, change the Extractor spring, or change the Breech Block.</p> <p>(4) Cock the mechanism. [a] Remove the magazine. Clear the round from the Receiver. Put on the magazine and continue firing. [b] If it recurs with the same magazine, discard for adjustment.</p> <p>(5) [a] Cock the mechanism and remove the magazine. Correct the displaced round in the magazine. Replace the Extractor or Breech Block and clear the Receiver by hand Cocking. [b] If the cartridge rim is torn, change the barrel, or clear with the cleaning rod.</p>

TABLE OF TEMPORARY STOPPAGES—continued.

1	2	3
Approx. Position of Breech Block.	Cause.	"Remedy."
<p>Stoppage No. 3. See Plate 16, Page 68. About $\frac{3}{4}$ of the Breech Block seen through the Ejection Slot.</p>	<p>(1) Misfeed—due to thick rimmed cartridge unable to slide under the Extractor. (2) Separated Cartridge Case. (Very infrequent with .303⁷ Ammunition.) (3) High Feed Piece—this may cause a No. 3 Stoppage by lodging inside the Front lip of the magazine. (This is unlikely if the Drill-Purpose Gun is used for setting up stoppages during Elementary Gun Drill).</p>	<p>(1) Cock the Mechanism to clear the misfed round. If repeated, change the Extractor. (2) Cock the mechanism. If part of the case in the chamber is not cleared when extracting the next round :— [a] Use the clearing plug. [b] Change the Barrel. If the "separation" is repeated, assemble the <i>Plus</i> Locking Shoulder to correct the Cartridge Head Space. (Armourer's job.) (3) Cock the mechanism to clear the round on the face of the Breech Block. Change the Breech Block, or change the Feed Piece and Pin.</p>
<p>Stoppage No. 4. See Plate 16, Page 68. Breech Block forward apparently in Locked Position.</p>	<p>(1) Misfire. (2) Gun un-armed. [a] Empty chamber, the round in the magazine not having been engaged by the Feed Piece, or [b] The Breech Block Catch failing to operate when the magazine is empty.</p>	<p>(1) Cock the mechanism to clear and continue firing. If frequent, change the Breech Block or Firing Pin. (2) [a] Cock the mechanism and continue firing. If repeated change the Magazine. [b] Cock the mechanism and change the magazine.</p>

LIST OF PARTS.

Part No.
on Arrgt.

NOMENCLATURE.

1	...	...	Receiver.	
2	...	...	Receiver Bottom.	
3	...	...	Receiver Pin.	
4	...	...	Bullet-Lead Cam.	} All permanent fixtures in the Receiver.
5	...	...	Feed-Piece Cam.	
6	...	...	Breech-Block Lifting Cam.	
7	...	...	Piston Stop.	
8	...	...	Fouling Pin.	
9	...	...	Gas Cylinder.	
10	...	...	Piston.	
10a	...	...	Piston Post.	} Parts of the Piston.
10b	...	...	Piston-Post Cams.	
10c	...	...	Piston-Actuating Lug.	
10d	...	...	Piston Catch.	
11	...	...	Breech Block.	
12	...	...	Extractor.	
13	...	...	Extractor Plunger.	
14	...	...	Extractor Spring.	
15	...	...	Feed Piece.	
16	...	...	Feed-Piece Spring.	
17	...	...	Feed-Piece-Axis Pin.	
18	...	...	Firing Pin.	
19	...	...	Firing-Pin-Retaining Pin.	
20	...	...	Firing-Pin Spring.	
21	...	...	Ejector.	
22	...	...	Ejector Cover.	
23	...	...	Ejector-Cover-Bridge-Piece.	
24	...	...	Ejector-Cover-Bridge-Piece Rivet.	
25	...	...	Magazine Catch.	
26	...	...	Magazine-Catch Lever.	
27	...	...	Magazine-Catch Bush.	
28	...	...	Magazine-Catch-Flap Spring (torsion).	

LIST OF PARTS—continued.

Part No. on Arrgt.	NOMENCLATURE..
29	Magazine-Catch-Lever-Axis Pin.
30	Magazine-Catch-Lever-Axis-Pin-Securing Pin.
31	Magazine-Catch Screw.
32	Magazine-Catch Spring.
33	Magazine-Catch-Spring Plug.
34	Magazine-Catch Slide.
35	Magazine-Catch Flap.
36	Breech-Block Catch.
37	Breech-Block-Catch Spring.
38	Breech-Block-Catch-Axis Pin.
39	Magazine-Opening Cover.
40	Magazine-Opening-Cover Pin.
41	Magazine-Opening-Cover Catch.
42	Magazine-Opening-Cover Springs.
43	Rear-Sight Boss (for Lewis Sight) (permanently fixed in the Receiver).
44	Tangent-Sight Stem.
45	Tangent-Sight Adaptor.
46	Tangent-Sight Pin.
47	Tangent-Sight-Pin Nut.
48	Tangent-Sight Sleeve.
49	Tangent-Sight-Aperture Plate.
50	Tangent-Sight-Aperture-Plate Screw.
51	Tangent-Sight Spring.
52	Tangent-Sight-Adjusting Screw.
53	Tangent-Sight-Adjusting-Screw Nut.
54	Tangent-Sight-Adjusting-Screw-Flat Spring.
55	Barrel.
56	Barrel-Stop Piece.
56a	Barrel-Stop-Piece-Securing Pin.
57	Barrel-Handle Bracket.
58	Barrel-Handle Catch.
58a	Barrel-Handle-Catch-Axis Pin.

LIST OF PARTS—continued.

Part No.
on Arrgt.

NOMENCLATURE.

59	...	...	Barrel Handle.
60	...	...	Barrel-Handle Plunger.
61	...	...	Barrel-Handle Stop.
62	...	...	Barrel-Handle Grip.
63	...	...	Barrel-Handle Nut (for Plunger).
64	...	...	Barrel-Handle-Grub Screw (securing Bracket (57)).
65	...	...	Barrel-Handle Pin.
66	...	...	Barrel-Handle-Pin Nut.
66a	...	...	Barrel-Handle-Pin-Nut Securing Pin.
67	...	...	Barrel-Handle Spring (for Plunger).
68	...	...	Barrel-Handle Spring (for Catch).
69	...	...	Gas Block.
70	...	...	Gas-Block Plug.
71	...	...	Gas-Block Filling Piece.
72	...	...	Gas Regulator.
73	...	...	Gas-Regulator Plug.
74	...	...	Pin (securing Gas Block).
75	...	...	Gas-Regulator Spring.
76	...	...	Sling Eye.
77	...	...	Front-Sight Bracket.
78	...	...	Front Sight.
79	...	...	Muzzle Tube.
79a	...	...	Muzzle-Tube Securing Pin.
80	...	...	Barrel-Locking Key.
81	...	...	Barrel-Locking Key Handle.
82	...	...	Barrel-Locking-Key Knob and Washer.
83	...	...	Barrel-Locking-Key Plunger.
83a	...	...	Barrel-Locking-Key Plunger Retaining Pin.
84	...	...	Barrel-Locking-Key Plunger Nut.
85	...	...	Barrel-Locking-Key Spring.
86	...	...	Back Block.
87	...	...	Back-Block-Securing Pin.
88	...	...	Back-Block-Securing Pin Plunger.

LIST OF PARTS—continued.

Part No.
on Arrgt.

NOMENCLATURE.

89	...	...	Back-Block-Securing-Pin Spring.
90	...	...	Recoil-Buffer Plunger.
91	...	...	Recoil-Buffer Spring.
92	...	...	Recoil-Buffer-Securing Pin.
93	...	...	Trigger-Guard Plate.
94	...	...	Main Spring.
95	...	...	Trigger.
96	...	...	Trigger Sear.
97	...	...	Trigger-Sear-Guide Pins.
98	...	...	Trigger-Sear Axis.
99	...	...	Trigger-Sear Pawl.
100	...	...	Trigger-Sear-Pawl Pin.
101	...	...	Trigger-Sear-Pawl Spring.
102	...	...	Trigger-Sear Spring.
103	...	...	Trigger Spring.
104	...	...	Trigger-Spring Boss.
105	...	...	Fire-Control Key.
106	...	...	Fire-Control-Key Plunger.
107	...	...	Fire-Control-Key Spring.
108	...	...	Fire-Control-Key Knob.
109	...	...	Locking Shoulder.
110	...	...	Locking-Shoulder Securing Pin.
111	...	...	Cocking Rod.
112	...	...	Cocking - Rod - Stop Piece (permanently fixed to the Receiver).
113	...	...	Cocking-Rod Handle.
114	...	...	Cocking-Rod Catch.
115	...	...	Cocking-Rod Claw.
116	...	...	Cocking-Rod-Claw Pin (with Split Pin).
117	...	...	Cocking-Rod-Handle Pin and Catch Pin.
118	...	...	Cocking-Rod-Handle Spring (torsion).
119	...	...	Cocking-Rod-Catch Spring.
120	...	...	Cocking-Rod Cover (in the Butt).

LIST OF PARTS—continued.

Part No.
on Arrgt.

NOMENCLATURE.

121	Ejection-Slot Cover.	
122	Ejection-Slot-Cover Catch.	
123	Ejection-Slot-Cover-Catch Nut	
124	Ejection-Slot-Cover-Catch Spring.	
125	Butt	
125a... ..	Pin (securing Butt to Back Block).	
126	Adjustable Butt-Rest Ferrule.	} (all in the Butt).
127	Adjustable Butt-Rest-Catch Bracket.	
127a... ..	Adjustable Butt-Rest-Catch-Bracket Screws.	
128	Adjustable Butt-Rest-Catch Spring.	
129	Adjustable Butt-Rest Catch.	
130	Adjustable Butt-Rest-Catch-Axis Pin.	
131	Butt Plate.	
132	Butt-Plate-Securing Screw.	
133	Butt-Plate-Retaining Screw.	
134	Pistol Grip R.H.	
135	Pistol Grip L.H.	
136	Pistol Grip Screws.	
136a... ..	Pistol Grip Nuts.	
137	Main-Spring Tube.	
138	Main-Spring-Adjusting Screw.	
139	Main-Spring-Adjusting Nut.	
140	Main-Spring-Adjusting-Nut Guide.	
141	Main-Spring-Adjusting-Nut-Retaining Screw.	
142	Front-Legs Bracket.	
142a... ..	Front-Legs-Bracket-Securing Pin.	
143	Front-Legs Hinge.	
144	Front-Legs Catches.	
145	Front-Legs-Axis Pin.	
146	Front-Legs-Axis-Pin Nut and Split Pin.	
147	Front-Legs Hinge Pins and Tie Pin.	
148	Front-Legs Distance Piece.	
149	Front-Legs Spring.	

LIST OF PARTS—continued.

Part No. on Arrgt.	NOMENCLATURE
150	Front-Legs Outer Tube.
151	Front-Legs Inner Tube.
152	Front-Legs Feet.
153	Front-Legs Collar.
154	Front-Legs Screw.
155	Front-Legs Keep.
156	Adjustable Butt-Rest Nut.
157	Adjustable Butt-Rest Outer Screw.
158	Adjustable Butt-Rest Inner Screw.
159	Adjustable Butt-Rest Stop Screw.
160	Adjustable Butt-Rest Centre Guide.
161	Adjustable Butt-Rest-Centre-Guide Stop Pin.
162	Adjustable Butt-Rest Foot.
163	Adjustable Butt-Rest Pin (securing Centre Guide to Outer Screw).
164	Adjustable Butt-Rest Pin (securing Foot to Inner Screw).
165	Magazine Case.
166	Magazine Spring.
167	Magazine Platform.
168	Top Cover.

Spare Parts and Accessories as Required.

NOTE.—When ordering new parts, the Part Number, the name in accordance with the above Nomenclature and the number of the Handbook should be quoted.

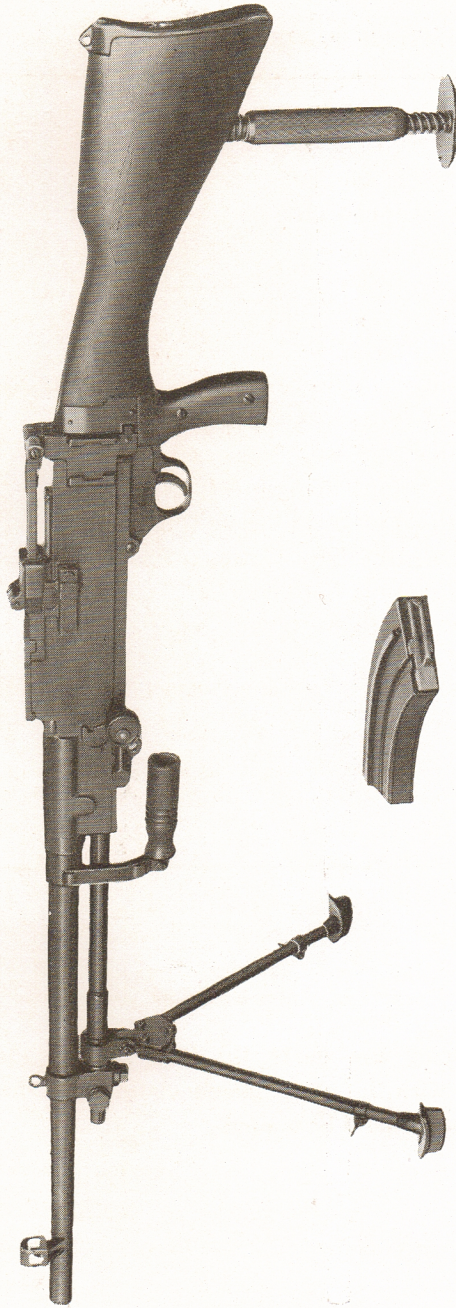
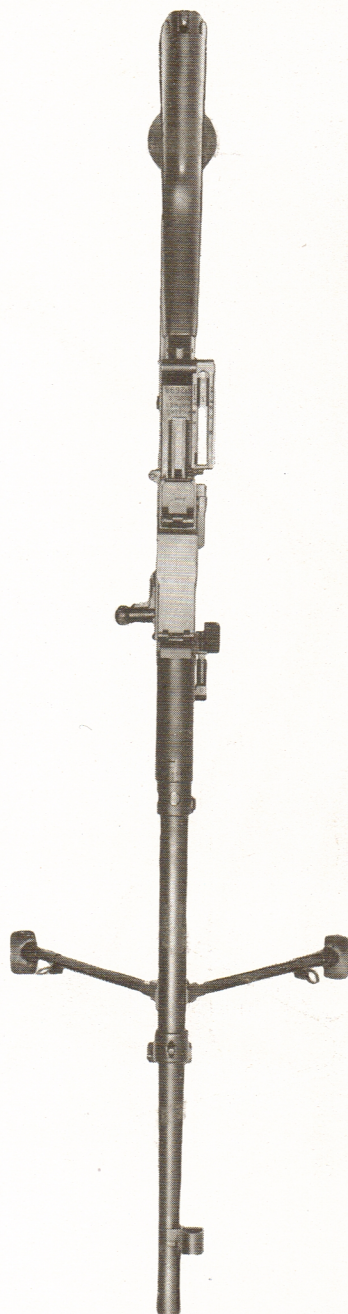


Plate 1.—Vickers-Berthier Light Machine Gun.
(For Land Service.)
View of the left side of the Gun.



*Plate 2.—Vickers-Berthier Light Machine Gun.
(For Land Service.)
Plan View of the Gun.*

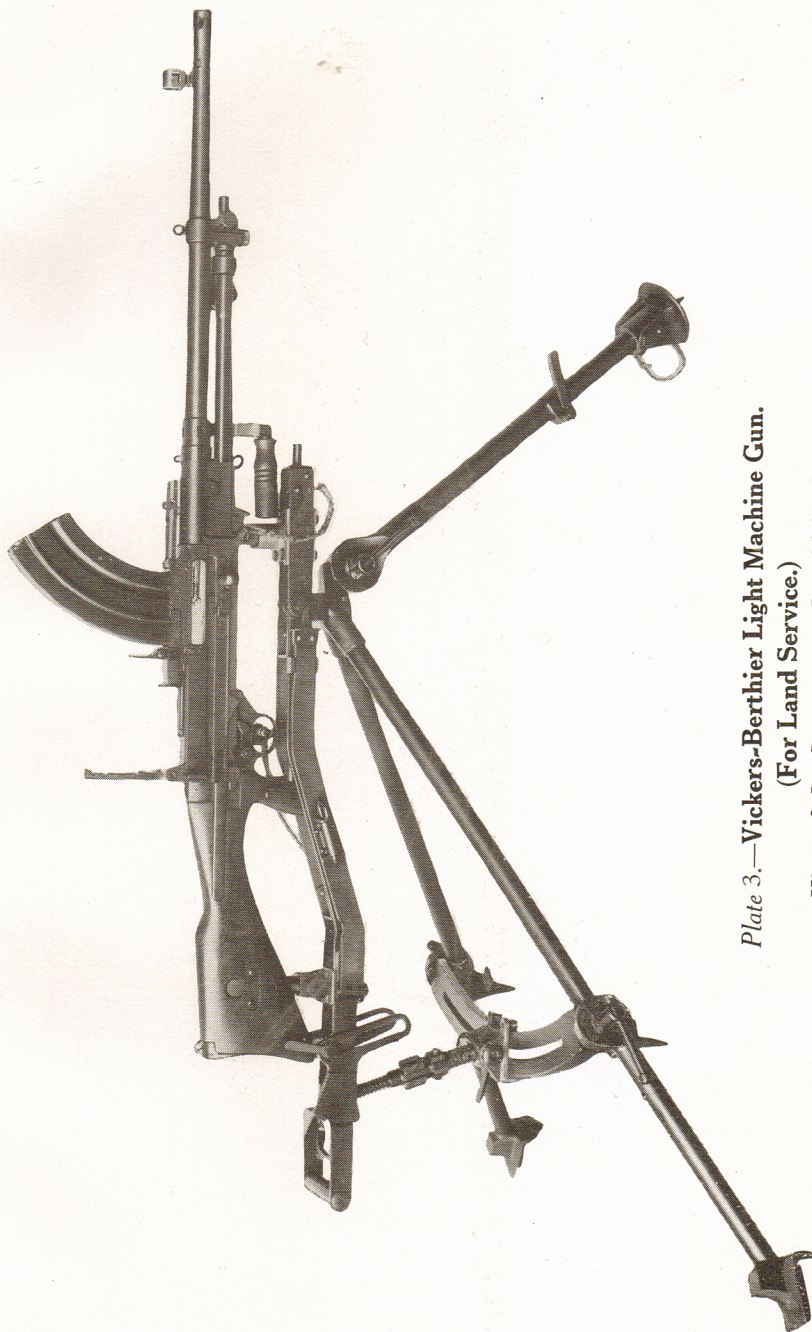


Plate 3.—Vickers-Berthier Light Machine Gun.
(For Land Service.)
View of the Gun mounted on Tripod.

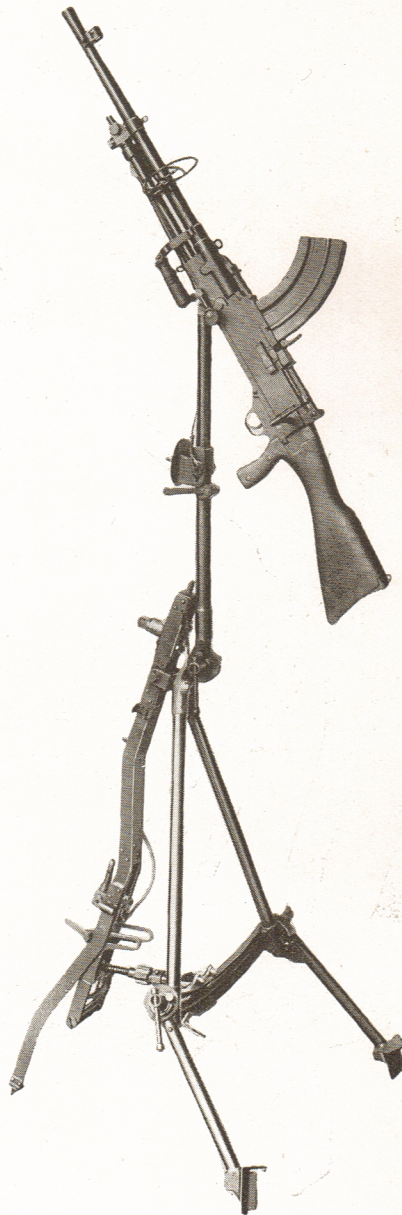
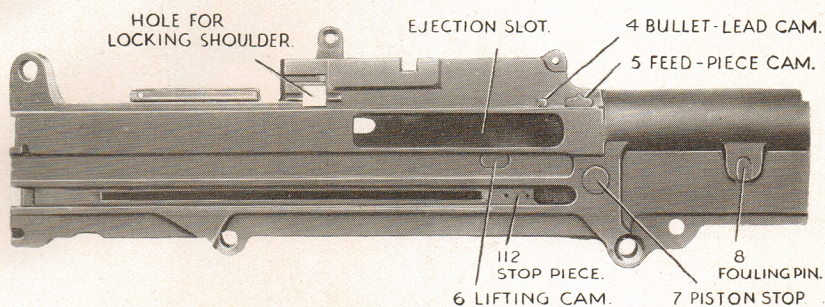
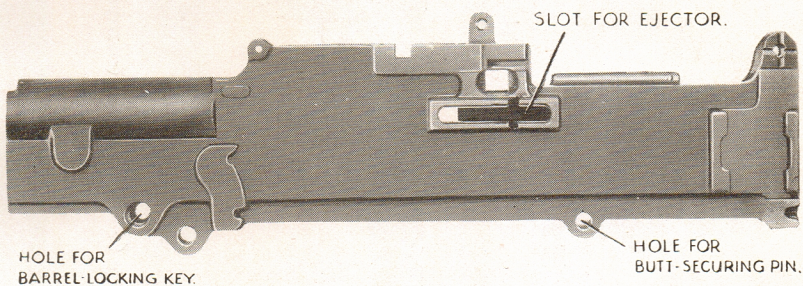


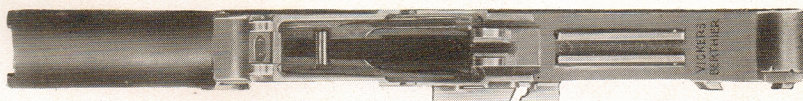
Plate 4.—Vickers-Berthier Light Machine Gun.
(For Land Service.)
View of the Gun mounted on Tripod for Anti-Aircraft Firing.



View of right side.



View of left side.



Plan View.

Plate 5.—Three views of the Receiver.

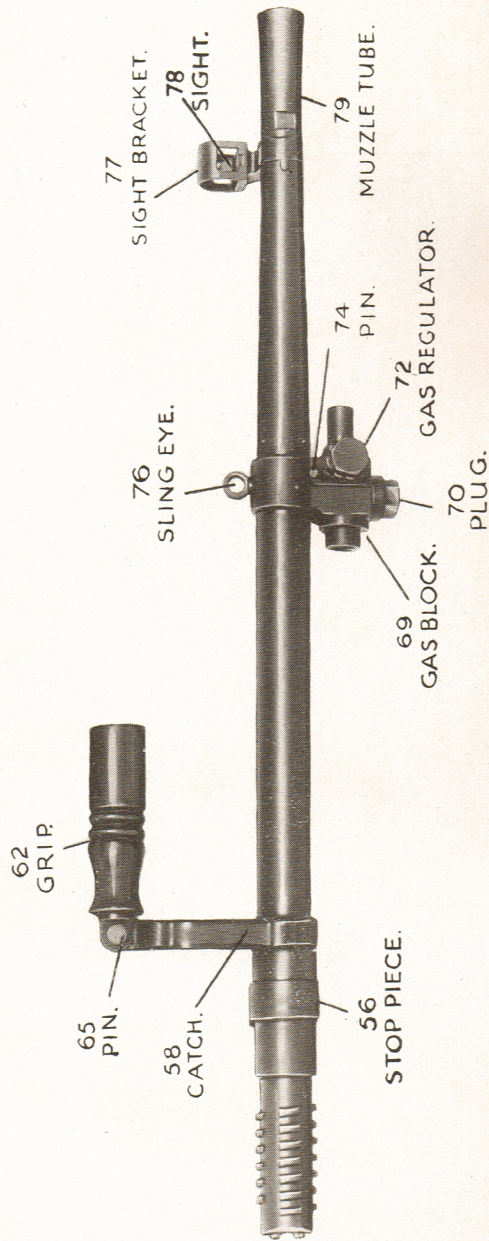


Plate 6.—The Barrel (complete).

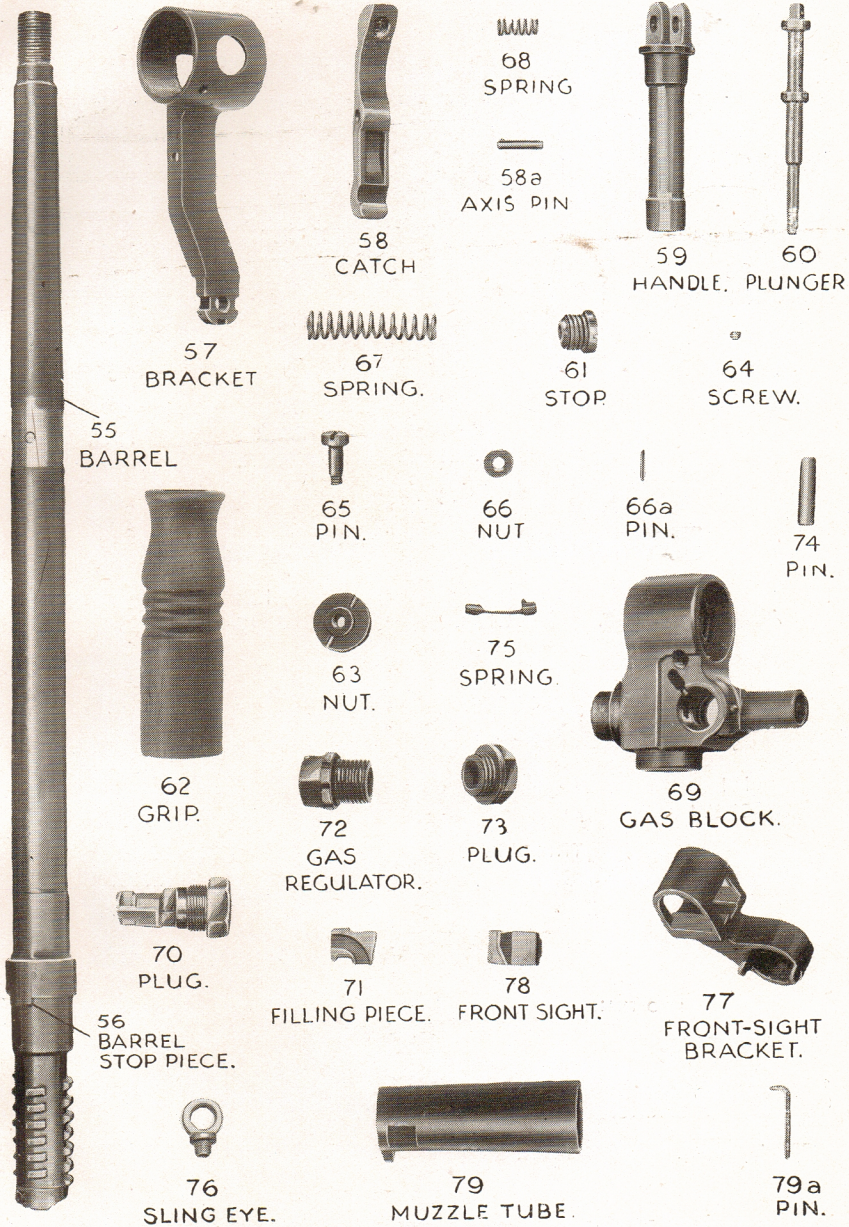
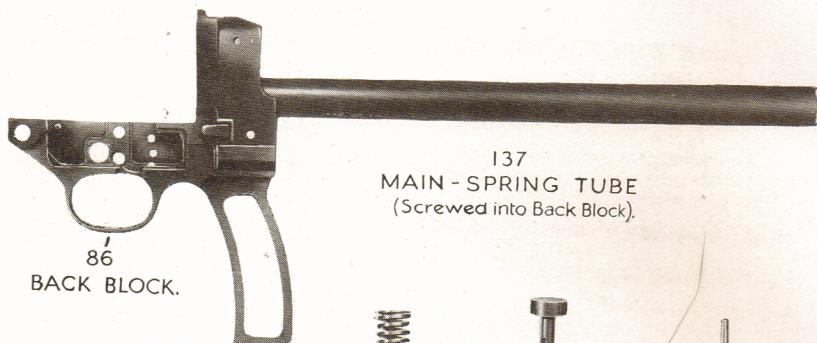


Plate 7.—The Barrel, with Details.



91
BUFFER
SPRING.



90
BUFFER
PLUNGER.



92
PIN.



139
ADJUSTING NUT.

140
GUIDE.



138
ADJUSTING SCREW.

104 BOSS.



95
TRIGGER.



141
SCREW.



103
TRIGGER
SPRING.



102
TRIGGER-SEAR
SPRING.

100 PIN.



96
TRIGGER
SEAR.

101
SPRING.

99
PAWL.



98
TRIGGER-SEAR
AXIS.



93
TRIGGER-GUARD
PLATE.



105
FIRE - CONTROL KEY.

108
KNOB.

107
SPRING.

106
PLUNGER.

Plate 8.—Back Block, with Main-Spring Tube and Details of Trigger Gear, etc.

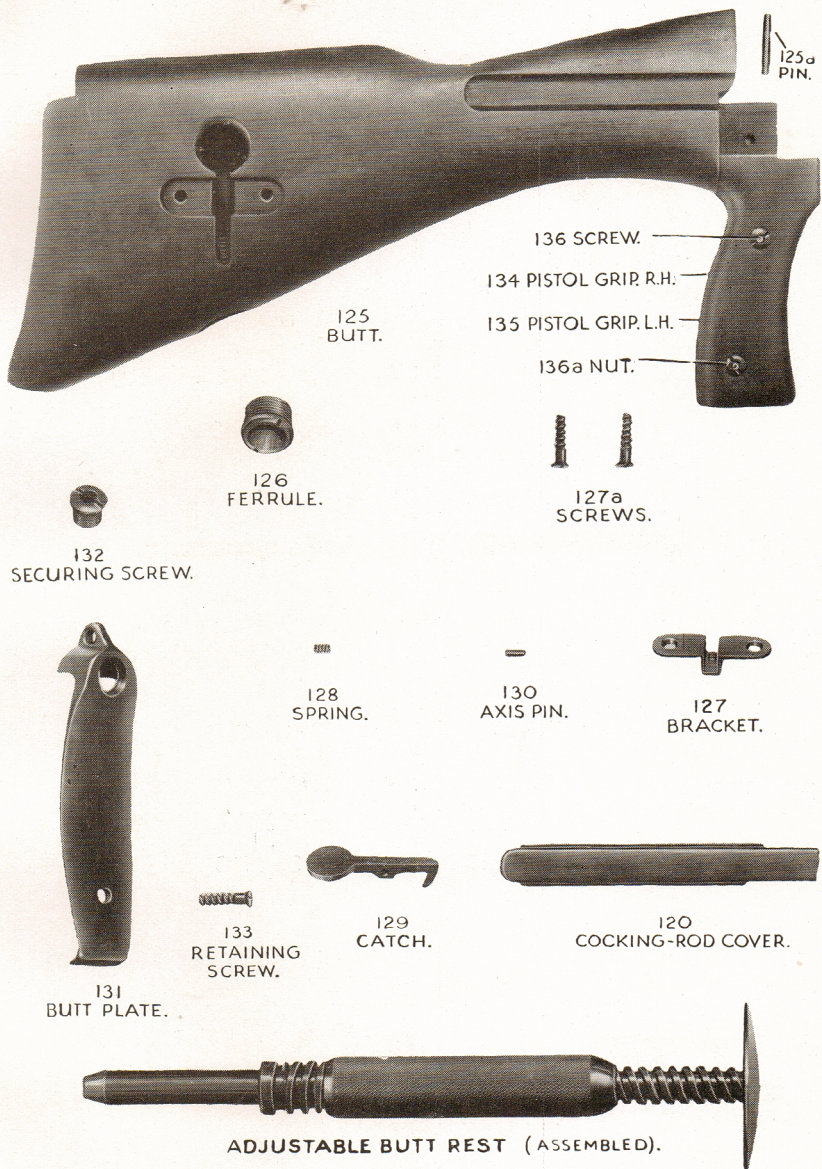


Plate 9.—Butt and its Details, with Adjustable Butt Rest.

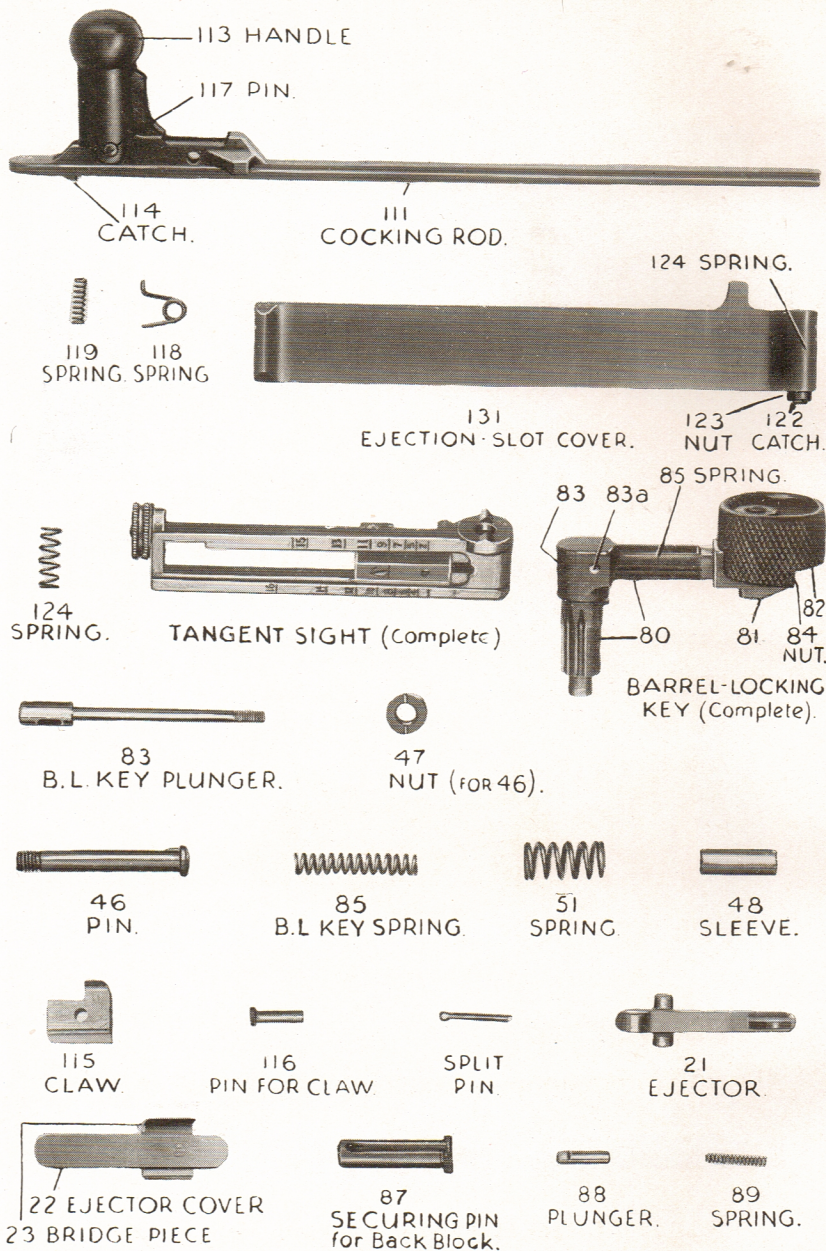


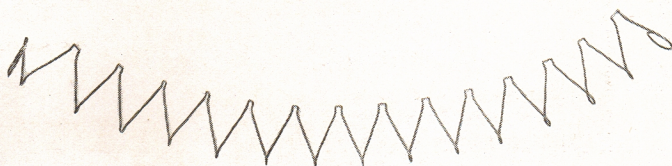
Plate 10.—Cocking Handle, Tangent Sight, Barrel-Locking Key, Ejection-Slot Cover, etc.



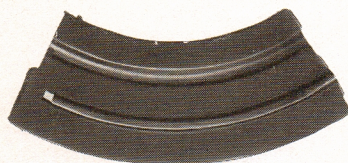
168
M.C.
TOP COVER.



167
M.C.
PLATFORM



166
M.C. SPRING.




165
MAGAZINE CASE.



94
MAIN SPRING.

Plate 11.—Details of the Magazine, with Main Spring.



30
SECURING PIN
for Axis Pin.



35
M.C.
FLAP.




33
M.C.
SPRING
PLUG.



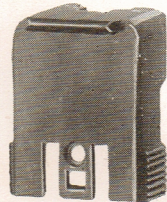
25
MAGAZINE
CATCH.



42
SPRING.




37
B.B.C.
SPRING.




34
M.C.
SLIDE.



42
SPRING.




28
M.C.
FLAP SPRING.



31
M.C.SCREW.




41
M.O.C.CATCH



29
M.C.
AXIS PIN.



26
M.C.
LEVER.




110
SECURING PIN
for
Locking Shoulder.



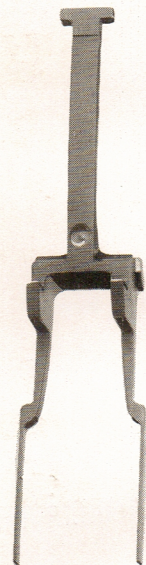
38
B.B.C.
AXIS PIN.




39
MAGAZINE-OPENING
COVER.



109
LOCKING
SHOULDER.




36
BREECH-BLOCK
CATCH.



40
M.O.C.PIN.



27
M.C.BUSH.



32
M.C.SPRING.

Plate 12.—Magazine Catch Details, Breech Catch, Magazine-Opening Cover, Locking Shoulder, etc.

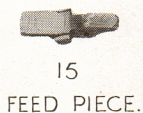
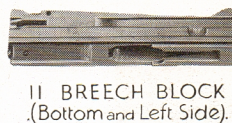
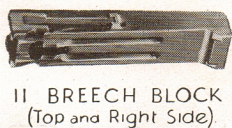
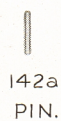
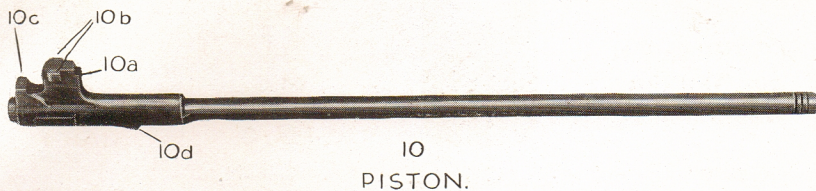


Plate 13.—Piston, Gas Cylinder, Breech Block and Breech Block Details.

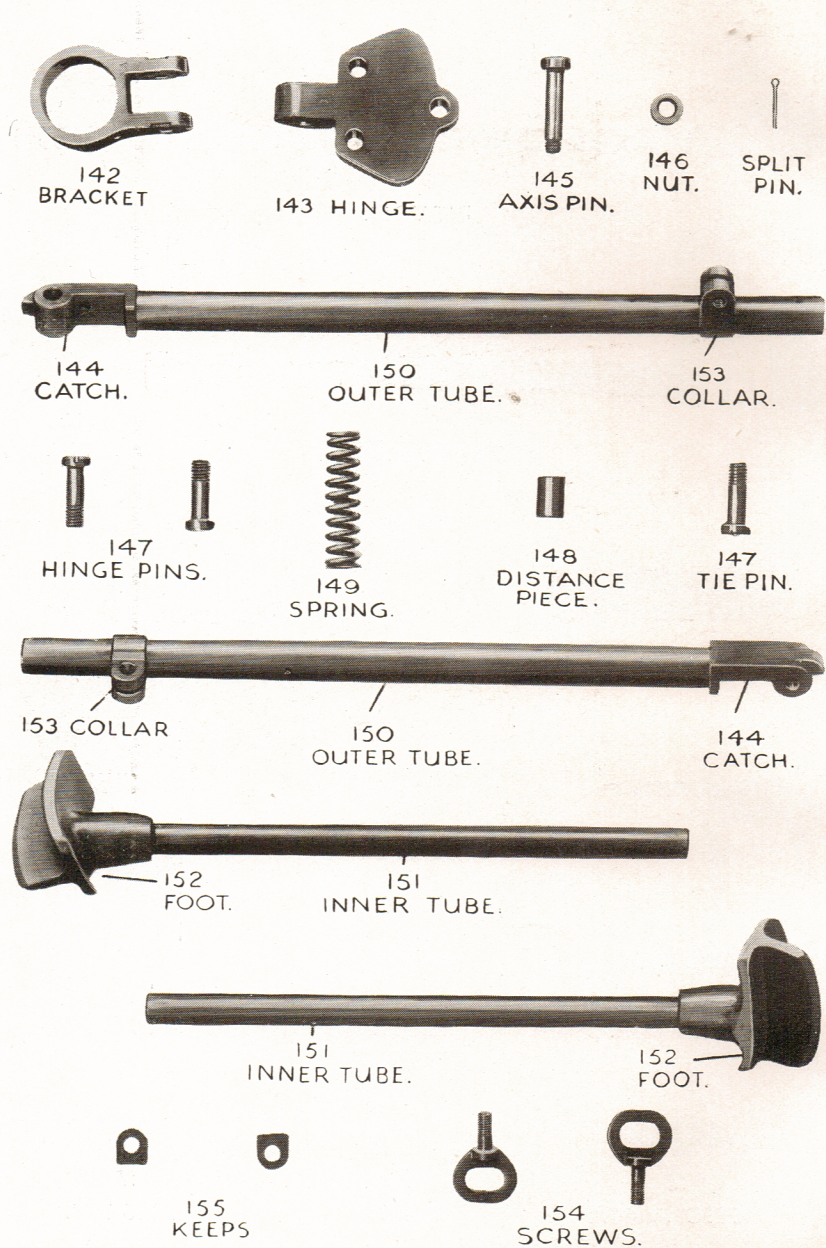


Plate 14.—Details of Front Legs.

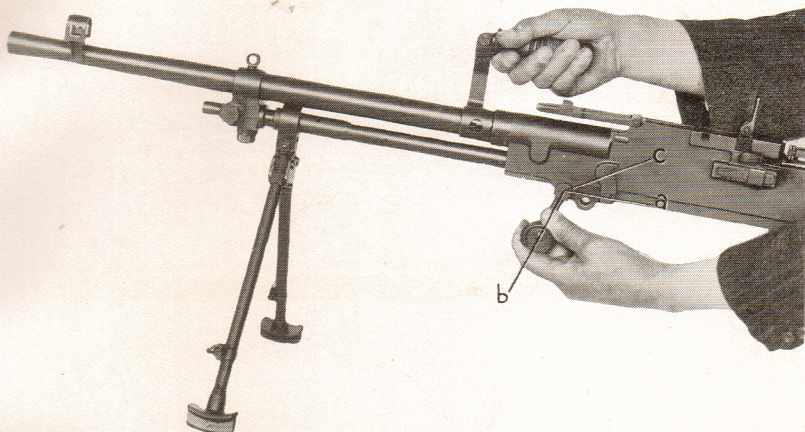


Fig. 1.—1st Position.

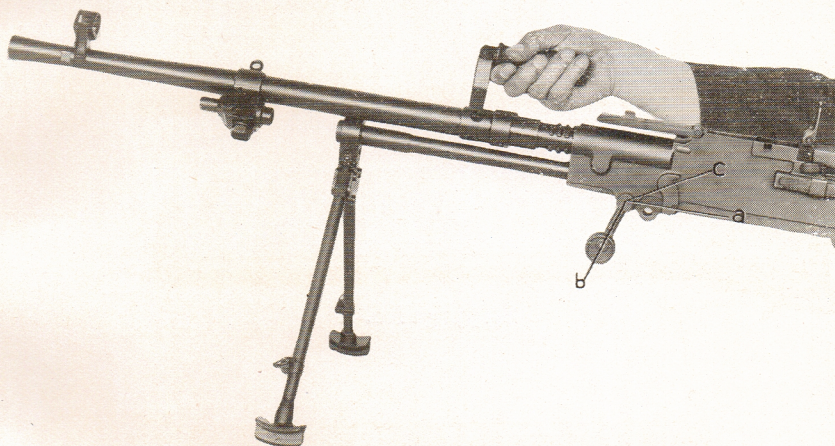
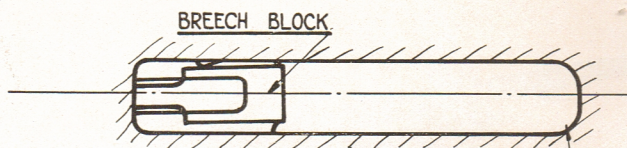


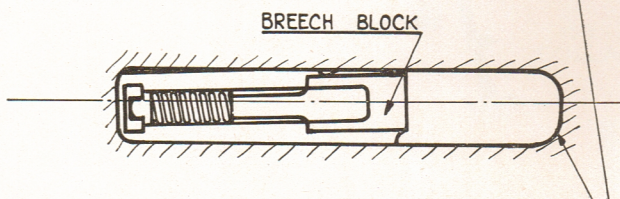
Fig. 2.—2nd Position.

Plate 15.—Dismantling the Barrel.

Locking-Key Handle at "a"	...	Barrel and Gas Cylinder locked.
Locking-Key Handle at "b"	...	Barrel unlocked, Gas Cylinder locked.
Locking-Key Handle at "c"	...	Gas Cylinder unlocked.

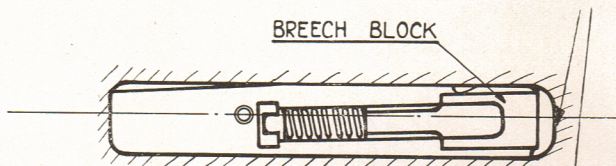


Stoppage No. 1.

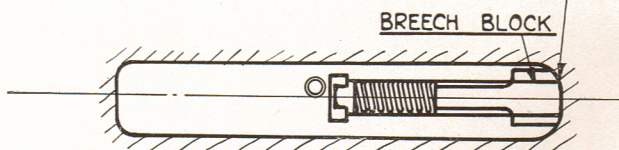


Stoppage No. 2.

EJECTION SLOT IN
THE RIGHT SIDE OF
THE RECEIVER.



Stoppage No. 3.



Stoppage No. 4.

Plate 16.—**Approximate Positions of the Breech Block for the various Stoppages.**

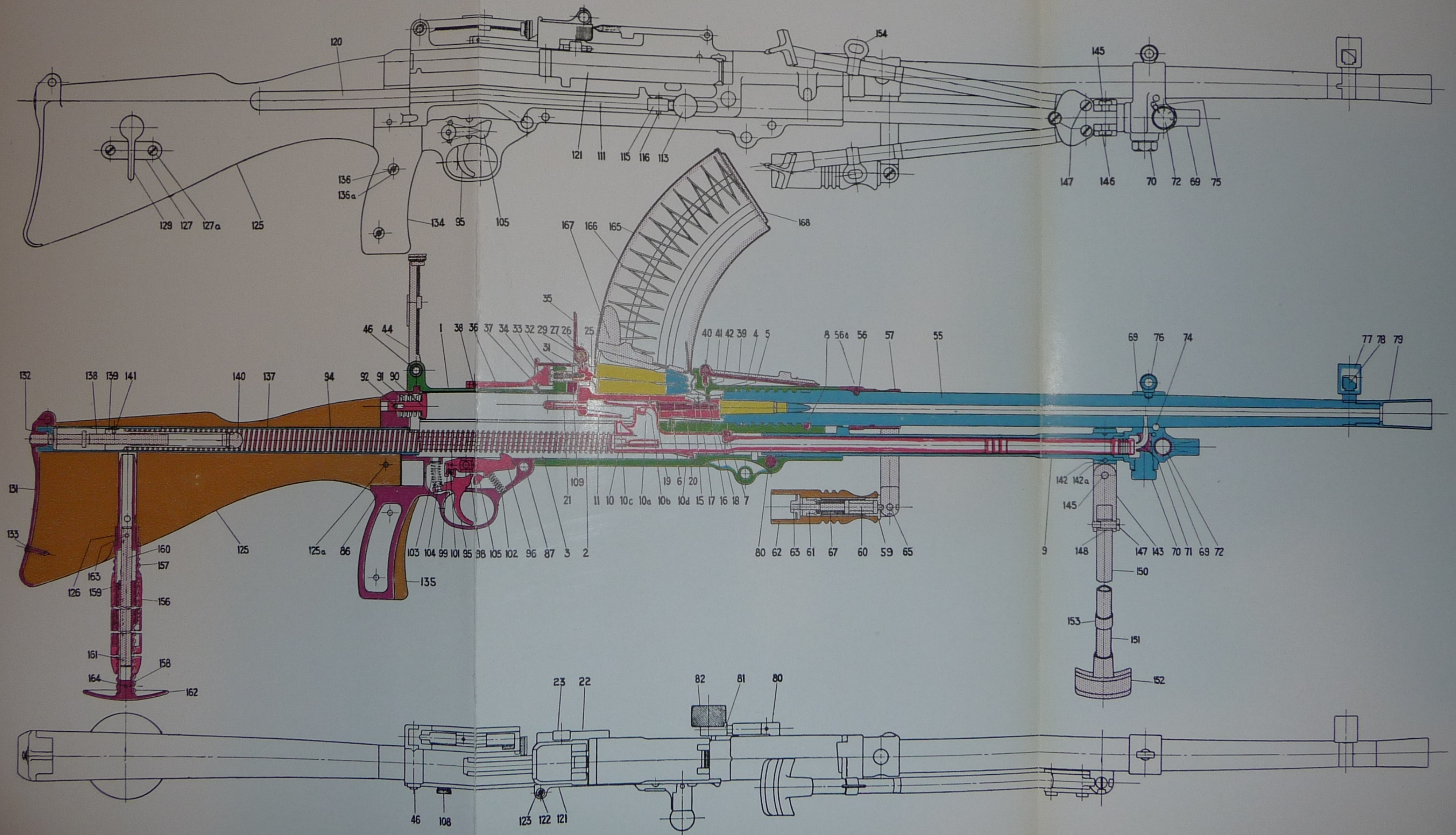


Plate 17.—Vickers-Berthier Light Machine Gun.
General Arrangement of the Gun.

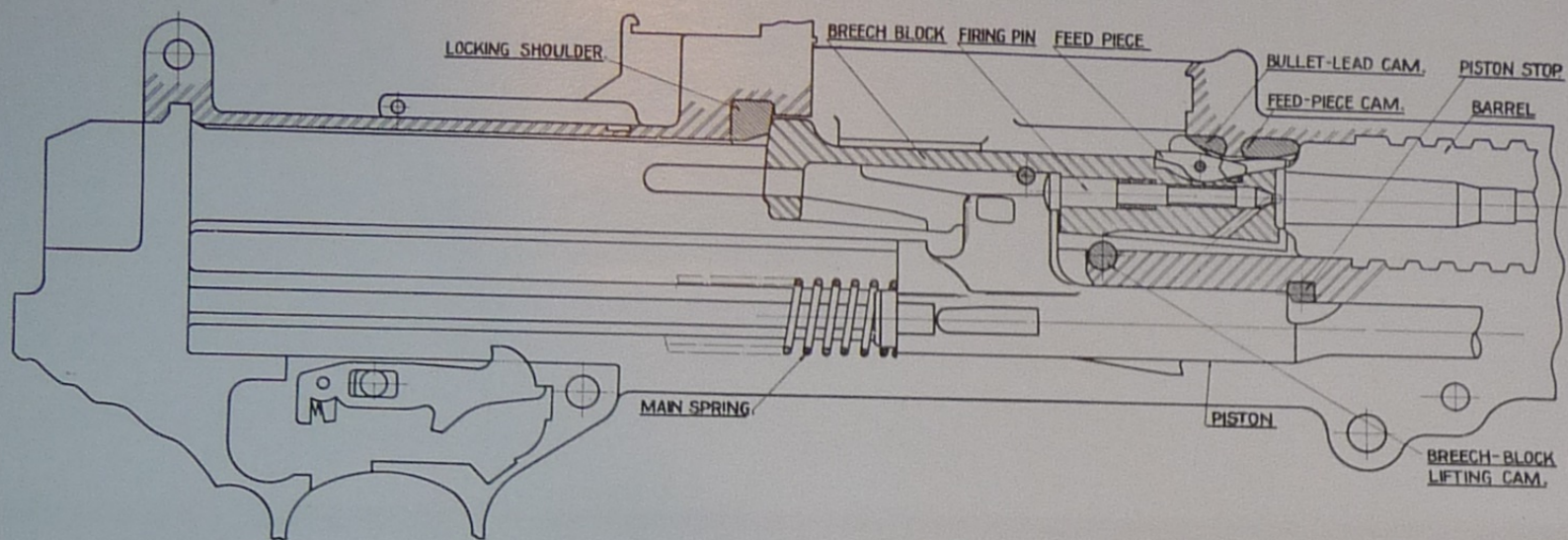


Fig. 1.—Breech Block and Piston in the Firing Position, Cartridge fired by the Piston Post having pushed forward the Firing Pin.

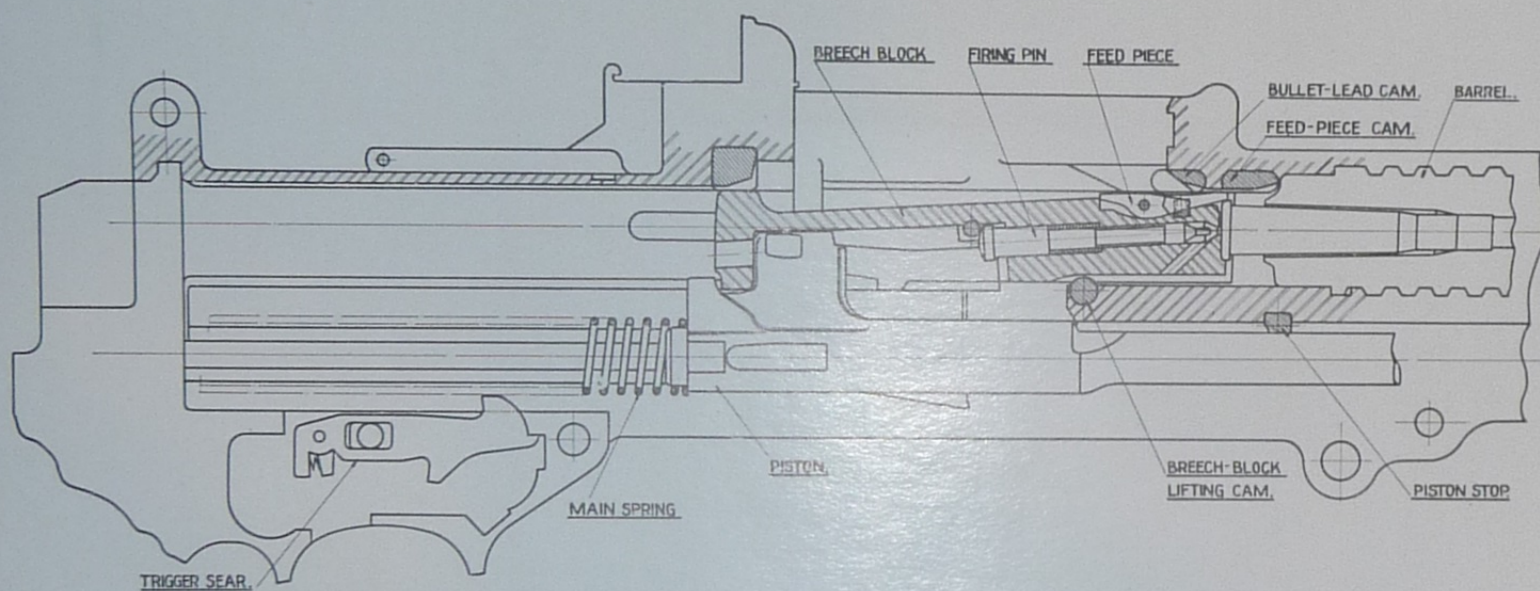


Fig. 2.—Breech Block and Piston partly recoiled. Breech Block unlocked.

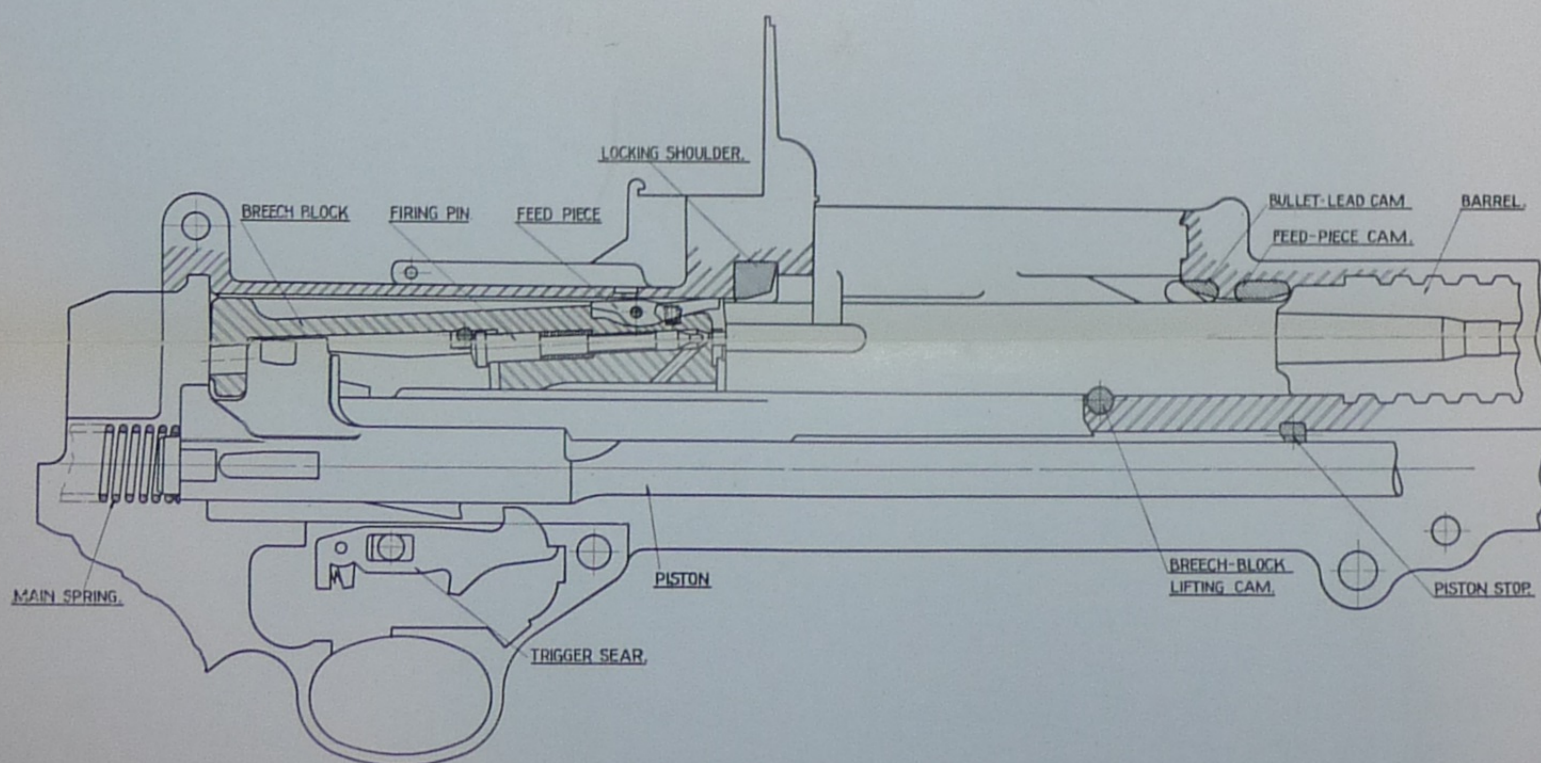
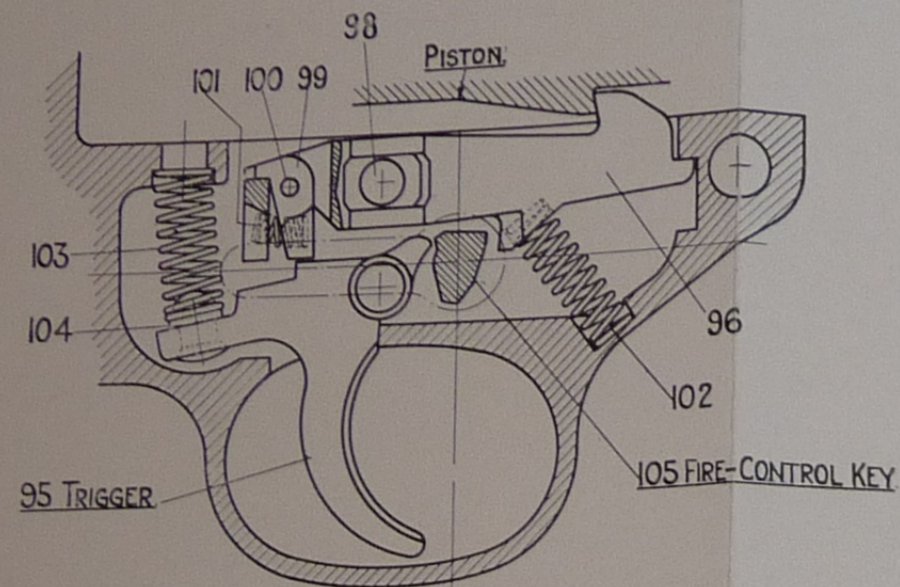


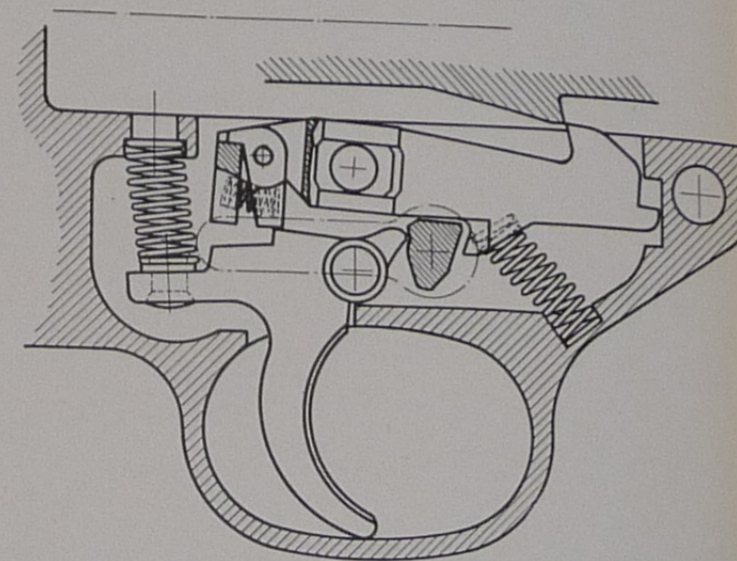
Fig. 3.—Breech Block and Piston fully recoiled.

Plate 18.—The Vickers-Berthier Light Machine Gun.
(For Land Service.)

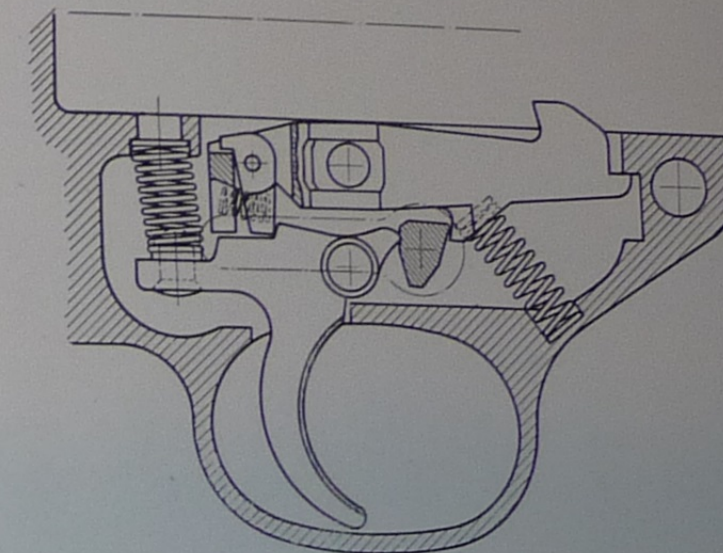
Diagrams showing the action of the Breech Mechanism.



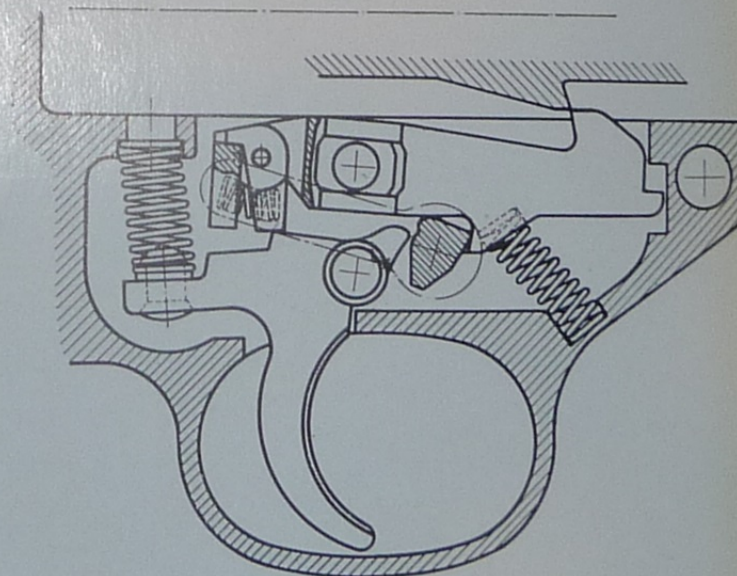
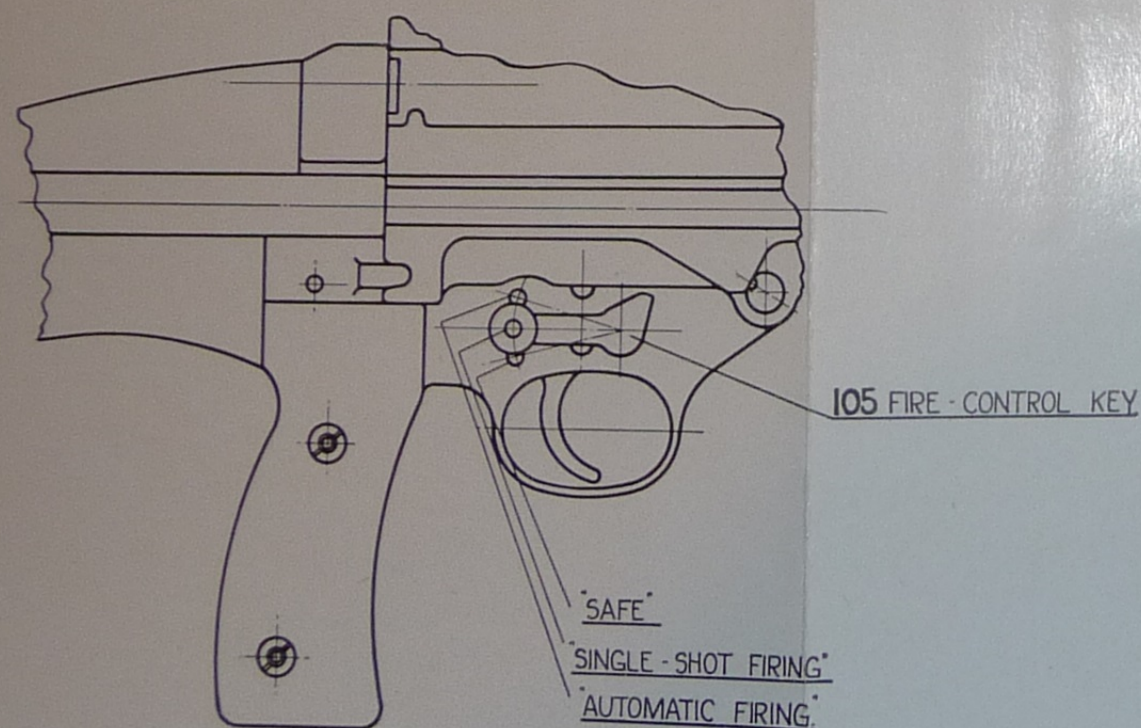
Fire-Control Key set for "Single-Shot Firing."
Trigger in the normal Position.



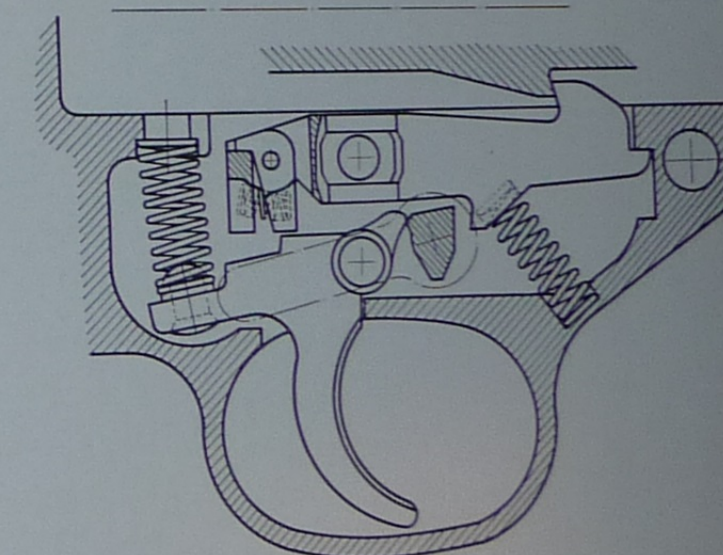
Fire-Control Key set for "Single-Shot Firing."
Trigger about to fire.



Fire-Control Key set for "Single-Shot Firing."
Trigger pulled right back. Gun fired.



Fire-Control Key set for "Automatic Firing."
Trigger pulled.



Fire-Control Key set to "Safe."
Trigger cannot be pulled.

Plate 19.—Vickers-Berthier Light Machine Gun.
(For Land Service.)

Diagrams of the Trigger Gear.



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